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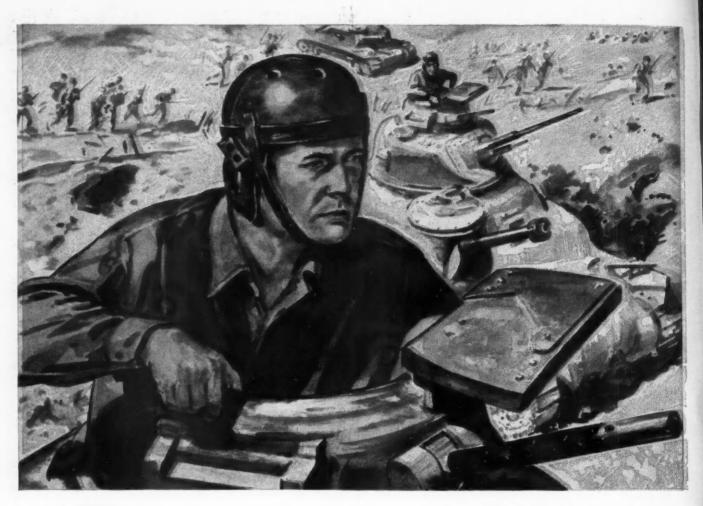
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UT in a cold, cruel world where nobody loved it, Turney's Turkey— otherwise known as Certificate of War Necessity Order No. 21—was being plucked of some of its feathers in January, with the pleasant prospect that it might freeze into a form not recognizable by its parent.

The parent, too-John R. Turney was out in the world. He resigned from ODT, giving as his reason the need for returning to his private law practice because two of his partners entered military service. His boss-Mr. Eastman-said Turney did not resign because of a row over General Order 21. On the other hand, Mr. Turney could not have been elated over the reception accorded his brain-child by truck operators and the support which many of their complaints got from Congressmen, from the press, from Rubber Czar Jeffers and even from Mr. Eastman himself. Mr. Turney is not the rowing kind, but it would be an insult to his intelligence to assert that he did not see in ODT's backing down a reflection on his judgment and convictions.

"No Backing Down"—Eastman

Mr. Eastman, however, publicly declared ODT was not "backing down from the intent" of General Order 21. Certainly he should know. But while there may be no backing down from intent there certainly has been backing down from the harsh manner in which administration and enforcement were started. The 300,-000 official squawks and the countless thousands of potential squawks that were squelched by the issuance of Temporary (all-the-gas-you-want) Rations received immediate attention and in a manner which certainly could not be interpreted as meaning that ODT was "sticking by its guns.

ODT Planned It That Way

Mr. Eastman does not think highly of the initial or introductory stage of General Order 21. He admits it



WASHINGTON RUNAROUND

Turney's Turkey's Feathers Plucked . . . "No Backing Down" Says Eastman . . . ODT Planned It That Way . . . "What Is Backing Down? . . . 21 Over the Top by Apr. 1 . . . 370,000 Certificates Revised . . . Truck Leasing May Be Liberalized

by GEORGE T. HOOK, Editor

had faults and concedes that much of the criticism was justified. (His remarks in this regard are published elsewhere in this issue.) He maintains that the initial stage proceeded according to expectations. That strange remark seems to mean that ODT" planned it that way." It is stranger still when viewed in the light of knowledge that ODT was advised beforehand that certain portions of 21 were unworkable and others were

confusing. Mr. Eastman appears to excuse the faults with the explanation that 21 had to be issued in haste.

What Is "Backing Down"?

Mr. Eastman may not look upon it as backing down, but the reports and records required originally are now undergoing revision. The objective is simplification.

The intent of 21 was certainly (TURN TO PAGE 129, PLEASE)



EASTMAN ADMITS 21'S FAULTS

Makes frank public declaration that forms, instructions and load factor formula were imperfect and caused justifiable criticism but insists the order will not be scuttled and experience will develop workable basis

DDRESSING the fourth annual (War Conference) meeting of the National Council of Private Motor Truck Owners, Inc., in New York City on Jan. 20, Joseph B. Eastman, director of the Office of Defense Transportation, took advantage of the occasion to speak frankly on the subject of the Certificate of War Necessity Order No. 21. He declared that "21" had been more severely criticized than any other ODT order; that criticism was anticipated: that it was proceeding according to expectations, and that it would not be scuttled. His remarks were the most revealing on the subject that he has made to date. He admitted the justice of some criticisms and stated that for putting "21" on a working basis ODT had never had a fixed and definite final program; that it was proceeding on the basis that experience would provide the final answer.

Mr. Eastman, as he himself put it, spoke "freely and frankly" and prefaced his comments with the remark that "In view of some reference that I have seen in the public press, I will make the categorical statement at the outset that General Order No. 21 will not be scuttled. We are not backing down from it. John Turney did not resign from my organization because of a row over 21, or because of any other row. General Order No. 21 is proceeding according to expectations."

Then Mr. Eastman confessed the seriousness of the decision that 21 involved and why he felt compelled to make it.

"We have had more criticism on account of that order than because of anything that we have done, but we knew that we would. We had full warning of what we might expect and the decision to issue that order was the hardest one that I have ever made: the hardest one to arrive at. When I finally made it I felt a good deal like the boys in the Army must feel who are called upon to go over the top at the zero hour. I gave the signal to go ahead, however, because I became convinced that it was necessary to do so and that it was my duty to do so for three principal reasons.

"In the first place, we had gasoline rationing in the East at that time and it was looming up ahead as a practical certainty so far as the nation was concerned. Under gasoline







rationing at the start, the local rationing boards had determined what commercial motor vehicles should have. The results have been unsatisfactory. They have been given practically what they asked for because the local rationing boards in most cases had no criterion upon which to determine their needs. In some cases the black market has been created on that account.

"The Office of Price Administration came to us and they said, 'We really think that it is your duty to tell how much gasoline under gasoline rationing these commercial motor vehicles should have,' and we were forced to admit that it was our duty logically to do that. Of course, that meant getting into contact with each individual operator and there was no escape so long as we were going to determine how much gasoline should be allowed to the operators.

"In the second place, we found it necessary to establish closer contact with the individual operators. We were issuing general orders without even knowing who the truckers were to whom they applied.

"In the third place, we saw that we must have a better vehicle for enforcement and that was supplied by General Order No. 21.

"Now, it was certain that within the time limits and the money limits at our command at that time the job could not be done at all perfectly. In fact, it was certain that it would be most imperfectly done at the outset and that the second stage of the work would be the most important. Also, that so far as the first stage was concerned, we would inevitably run into many justifiable complaints.

"As I have said, you cannot set limits for either mileage of gasoline or individual operators not knowing who those operators are and without having information in regard to their individual operations. The best way to do that would be to sit down across the table with each individual operator. It is the sort of problem which really calls for that kind of treatment. That was absolutely impossible. We couldn't recruit within the time available, or with the means available, such an army of men as would have been necessary for that method of dealing with it.

"We found it necessary to establish contact with the operators and get the information at the outset by mail. There was no other way to do it. So far as the fleets were concerned, we were able to turn the work of getting the certificates out over to the field staff which we had organized. They could not, within the time limits, do that for the great mass of the one or two-truck operators. There we had to resort to shortcut expedients with the hope that we could get over the hump in that way and into the second stage of this operation."

The situation that developed, according to Mr. Eastman, "was worse than we thought it would be and that was bad enough." Then he mentioned some of the problems that were encountered and the factors that brought on the criticism.

"The application blank which we got out was open to criticism," he admitted. "The main reason for that was that we had to use one form of blank for all of the small operators. We had one for the fleets and one for the small operators.

"Bear in mind that when we sent those blanks we did not know what kind of an operator it was going to. Even if we had known, within the time at our command, I don't think we could have gotten up a separate blank for each one of them. So that there were questions on them which were often inapplicable to the men who received them. That was open to criticism and that has been criticized.

"The instructions which went with those blanks were not well done. They were too bulky and voluminous. The main reason for that was that after they had been prepared in their first form and the time had come to revise them thoroughly, we got an ultimatum from the general printing office in regard to the printing of these things and we just had to let them go ahead if we were going to come within the necessary time limits.

"Those instructions ought to have been revised and boiled down and made clearer.

"We asked people, if they couldn't give accurate information (we knew that most of them could not) to give the best guess they could. More than we had hoped gave no information at all. In these cases we had to do something to get a certificate into their hands before the time of gasoline rationing so that they could carry on until we could organize and

get more information in regard to their operations.

"You heard a good deal about the load factor formula. We were warned in regard to imperfections of that formula before it was used. We knew that it would not work always in all cases by any means. It was one of the expedients that were used to get over the hump and, on the whole, I think it is a sound test. It won't always work, of course, but, on the whole, it tests efficient operations—amount of mileage performed and the amount of load carried—and those tests were not harshly applied in the initial stage of this certificate matter.

"One of the reasons why we didn't want to emphasize that formula was because we felt so sure that it could not be applied in many of the cases which would come before us on initial applications and because we felt that as we gained more experience, departures from any formula would be necessary.

Mr. Eastman indicated that he was counting upon the experience gained so far and upon cooperation of operators to put "21" on a satisfactory, workable plane. He spoke of this as being the "second stage" of "21".

"The second stage of this matter," he said, "we regard as the most important of all: that of getting down to a working basis. This involves education of the operators and education of ourselves.

"We never have had a fixed and definite final program with respect to this matter. We have always proceeded on the basis that we would learn, as we went along, through experience. Now we have learned and have done certain things.

"The farmers proved to be a very difficult problem. From the start we cooperated with the War Department in regard to farmers' trucks. We have now found that we can in effect extend our operation through the use of the Department of Agriculture County War Boards which have all organized county farm transportation committees to deal with this particular problem.

"I want it understood that that doesn't mean that the farmer, so far as we are concerned, is going to get all the gasoline that he wants. I am perfectly clear that farm vehicles have got to be kept in operation. They are essential to farm operations

(TURN TO PAGE 112, PLEASE)



THE trucking industry, holding its own during 1942 despite mounting

difficulties, faces far more serious problems in 1943 than any encountered during the first year of the war, according to the Office of Defense Transportation. No truck owner in the United States—from the farmer or corner grocer, with a single delivery truck, to the big fleet owner—will be immune.

For some, the tire shortage will continue as the most pressing problem; for others, it will be lack of manpower for operation or maintenance or both; for others, it will be parts; for others, it will be vehicles; for many, it will be a combination of all four. All these problems are being closely watched by the ODT, and programs have long been under way to prevent them from becoming more serious.

By and large, truck operators have indicated they are aware of the seriousness of the situation facing the industry and are taking steps to eliminate equipment and manpower, the ODT said. To those operators who depend on some "miracle" rather than their own efforts to keep their trucks in operation, the ODT had only this to say: You're heading for trouble.

Briefly, here's the way the situation looks to the ODT:



MANPOWER

Shortages of manpower, both for operation and maintenance, began to crop up in 1942 and will become steadily more serious during 1943. The trucking industry continues to be subject to a two-way manpower drain—one from the armed services, the other from war plants.

Proper maintenance requires trained mechanics. They will be harder and harder to find as time goes on. Proper operation of trucks, both big and small, requires trained drivers. They, too, will be harder and harder to find.

This means that everything possible must be done, through training, upgrading of workers and otherwise, to utilize available manpower to its



ODT PREVIEWS 1943

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maximum capabilities. It means also that women must take over "man's work" wherever practicable.



TIRES

Military requirements for rubber will leave only 45 per cent as much crude rubber for commercial motor vehicles for 1943 as they used up in 1941. Moreover, most tires now being built for commercial vehicles are composed of a mixture of crude and reclaimed rubber, which means that they will wear out faster and won't stand up as well under heavy loading or other harsh treatment. It also means that speeds must be held down.

Further, it means that more care than ever before must be given to tire pressure, wheel alignment and other mechanical details and driving practices generally.



PARTS

The parts situation can be summed up in four words: "Tight and getting tighter." Recognizing the need for keeping present vehicles in operation as long as possible, the ODT has taken steps to speed up production of parts in 1943. Production will be carefully trimmed to actual requirements.

There is only one possible conclusion: Wherever mechanics and facilities are available, worn parts which can be rebuilt or otherwise repaired should be reclaimed and put back into service. Modern rules of lubrication should be studied and applied without fail. Putting off a lubricat-

ing job may mean costly—or even impossible—repairs later on. Correction of minor mechanical ailments, which can lead to major breakdowns if neglected, should be made promptly.



VEHICLES

There were some local tieups due to lack of equipment, but so far there has been no serious overall shortage of trucks. The large supply of vehicles in operation at the beginning of the war, plus a combination of reduced mileage, controlled replacements, improved operating efficiency and better maintenance is a partial explanation of the fact that the trucking industry generally was able to hold its own during 1942 despite wartime increases in truck traffic and lack of normal supply of new vehicles.

The coming months, however, will produce new problems — problems that will vary from month to month. As manpower shortages increase—as they are bound to—proper maintenance will, in turn, become more and more difficult to obtain. On the other hand, as more and more waste mileage is eliminated from truck operations generally, maintenance problems will be eased somewhat.

FARM TRANSPORTATION — One of the most serious transportation problems facing the country for 1943 is in the farm truck field, where increased production has resulted in greater use of vehicles, where the average age of trucks is traditionally greatest and where advanced maintenance facilities are not always available.

The extent to which farmers and

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PROBLEMS

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others engaged in the transportation of farm products and supplies cooperate in the mileage saving program, and the degree to which maintenance practices are improved, will be important factors in preserving farm transportation during the coming months.

OVER-THE-ROAD SERVICE-The continuance of adequate over-theroad motor transport also can be expected to become increasingly difficult during 1943. Here's where the war load is heaviest already, and production did not hit its full stride in 1942. While there has been no serious shortage of over-the-road trucks and trailer combinations up to the present, the increase in traffic during the past months has left less time than normally for maintenance of equipment, and, as the manpower situation becomes tighter, maintenance problems will assume larger and larger proportions.

The tonnage hauled by over-theroad trucks has set successively higher records in recent months, and new records are in prospect. These records have been made possible not by any substantial increase in the number of vehicles pressed into overthe-road service but by heavier loading, reduction of empty mileage and greater efficiency in operations all along the line.

Still further increases in tonnage handled without corresponding increases in the number of vehicles in service is to be expected in over-the-road transport, but further mileage reductions in this field must be made largely through the formation of joint action plans to eliminate duplicating operations and otherwise improve efficiency.

LOCAL SERVICE — A substantial part of the 40 per cent mileage re-



Manpower shortage will be chief concern of operators with no relief in sight on tires. Parts may get tighter and supply of vehicles spotty. Local operations face crucial period

duction necessary to meet the 55 per cent reduction in crude rubber available for 1943, as compared with 1941, will have to come from local delivery operations. The ODT estimates that mileage already has been cut by more than 25 per cent in this field, but it is believed that a much greater reduction can be made during 1943, without loss of needed service to the public.

Curtailment of services, such as the elimination of call backs, special deliveries and reduction in frequency of deliveries, was principally responsible for the mileage pared from local delivery operations during 1942. In 1943, the ODT looks chiefly to the formation of more joint-action plans for the additional saving needed to put the trucking industry "over the top."

TIME THE ENGINE TO YOUR

Tests show that retarding spark is best war-time measure. Enriched carburetion wastes power and fuel



By D. P. Brenz, H. H. Maxfield, A. B. Culbertson, Shell Oil Co., New York, N. Y. Excerpted from a paper presented at the 1943 Annual Meeting, Society of Automotive Engineers

The steadily increasing quality trend in motor gasoline manufacture has been interrupted by the demands of the war effort, with the result that operators of automotive equipment, since 1941, have been faced with a reduction in anti-knock rating of regular grade gasolines. Prior to the war emergency, regular grade gasolines had reached a level of 74 to 76 octane number, but late in 1941 this level was reduced to approximately 71 to 72 octane number.

Because many commercial engines are operated at or near full throttle for a large percentage of their operating time, it was felt that the use of the reduced octane number fuels in commercial engines might involve more serious losses in performance than in passenger car engines. When encountering objectionable detonation, using fuels lower in octane number than those for which the engine was designed, the fleet operator is faced with the problem of making engine readjustments which will reduce detonation and produce the lowest possible losses in power output, gasoline mileage and engine life.

This investigation was undertaken to provide further information on the fuel requirements of several representative types of modern commercial engines, and to evaluate the effects of engine adjustments on the power output and fuel consumption.

From a large fleet of tank trucks available, nine units of 23/4 to 4-ton rated capacity were selected for these tests. The major portion of this

work was conducted in five units under carefully controlled, heavily loaded conditions in highway operation.

In these tests it soon became apparent that the commercial engines tested could readily be adjusted to use the current 71 to 72 octane number gasoline without serious losses in power output or fuel economy. However, of the various methods which can be used to reduce the octane requirement of engines, retarding the spark timing appears the least harmful and is the only readjustment which appears to be necessary for satisfactory operation on the regular grade gasolines currently supplied.

OCTANE REQUIREMENTS

Although in these tests octane requirements of only five engines were obtained, the spread in their requirements, which ranged from 70 to 76 octane number under the most severe operating conditions, i.e., 15 to 25 m.p.h., indicated that detonating will be encountered with certain heavy duty engines on the present 71-72 octane "regular" grade gasoline unless compensating adjustments are made.

INFLUENCE OF SPARK TIMING

From the results of these tests using heavy duty engines, it appears that standard spark timing, as specified by the manufacturer, closely approaches full throttle maximum power timing.

The test data indicated that retarding spark timing five degrees from the standard setting gives a 5 per cent loss in acceleration with a corresponding 6 to 8 unit reduction in octane requirement. Only slight losses in acceleration resulted from retarding spark timing to compensate for a five octane reduction in octane requirement.

It has been shown that small changes in spark timing quite effectively reduced the octane requirement

FUEL

of the engines tested, without appreciably affecting power output. Tests were then conducted to determine to what extent such changes would affect fuel consumption.

Mileage tests with fully loaded trucks at 30 m.p.h., in high gear, showed that retarding spark timing 5 degrees gave an average decrease of $2\frac{1}{2}$ per cent in mileage, with a maximum loss of 5 per cent from that obtained at standard timing. This retard in timing reduced the average octane requirement 8 and 6 octane units at low and high speed respectively.

EFFECT OF CARBURETION

The test data indicated that knockless operation on the 70.5 octane fuel required enriching the mixture from 13:1 A.F.R. to 9.6 A.F.R. for a subsequent loss in acceleration of 13 per cent at low speed and 10 per cent at high speed.

This relatively large decrease in power, resulting from enriching the mixture to compensate for detonation on the 70.5 octane fuel, is in contrast to a 3 per cent loss which resulted from retarding the spark $6\frac{1}{2}$ degrees with no change in carburetion.

In addition to investigating the influence of mixture on acceleration, mileage tests were made in the same vehicle to determine the effect of this factor on fuel economy. The exhaust gas analyzer indicated that normal carburetor metering for this engine when operating on level highway, in high gear, fully loaded, and at 30 m.p.h. was 13.7 A.F.R. While extensive tests to determine the effect of carburetion on economy were not made, results indicate a 15 per cent decrease in economy by changing from 13.7 to 11.7 A.F.R. Knockless performance was obtained on the 70.5 octane fuel by either enriching the carburetor mixture 3.4 air-fuel ratios or by retarding timing 5 degrees. Enriching the mixture gave a mileage



loss of 25 per cent, but retarding spark timing decreased mileage only about 4 per cent.

From the results of these tests it does not appear feasible to lower engine octane requirements by enriching carburetion. Such compensating adjustments appear to give much greater relative loss in power and economy, for a given octane reduction, than is obtained from retarded spark timing.

TIMING FOR VARIOUS OCTANES

In previous discussion it was mentioned that the average octane requirement of the five engines tested under the most severe conditions was 73 octane number, based on equivalent reference fuel octane numbers.

However, subsequent tests indicated that, due to the severity of the heavy duty engines when operating under full load, an estimated 75 ASTM octane commercial gasoline would be required for border-line knock operation when using standard timing and carburetion.

These tests indicated that use of the 66 octane fuel necessitated retarding the timing an average of 9 degrees, while the 77 octane fuel permitted advancing the timing 1½ degrees. It will be noted that allowable spark settings varied considerably between the engines tested depending upon their severity and octane requirement; i.e., using the 70.5 octane fuel, optimum settings varied from ½ degree advance to 8 degrees retard for an average of $4\frac{1}{2}$ degrees retard.

(TURN TO PAGE 70, PLEASE)



The Transportation Division of the Tennessee Valley Authority operates 2300 vehicles of practically every description. This great fleet actually operates a great drive-it-yourself system. It caters to the needs of about 5000 potential drivers. Vehicles are requisitioned by the various TVA units and charges are made on a mileage or hourly basis.

Rates are based on operation costs. Thus, as costs become everybody's business, the management is ever on the spot. To cut costs and conserve equipment, manpower, gas, tires and vehicles, the management has established vehicle pools; employs an unusually thorough preventive maintenance system; makes the most of every scrap of material. Gas consumption is held low and an unusual oil-change policy is showing big savings.

icy is showing big savings.

The details of the operation and the broad conservation program are outlined in this article. Other articles will deal with the preventive maintenance program and shop salvage practices.



TVA base garage at Knoxville. This and other TVA garages are efficiently laid out, well lighted

THE Tennessee valley, often called "America's Ruhr" is a giant war machine with thousands of parts. Here hundreds of huge war plants pour out an ever-increasing stream of everything from aluminum for fighter planes to lowly duffle bags. And the power that makes this great war materiel machine operate is furnished mainly by the huge dams of the Tennessee Valley Authority.

Without the electric power furnished by the TVA's 14 major dams, this vast stream of weapons and munitions would not be, because the TVA's contribution of electricity represents a major portion of the power necessary to activate the war production of this area.

TVA's great fleet of passenger cars, trucks and other vehicles plays a vital part in the many activities of the TVA. Our more than 2300 vehicles, the bulk of which are trucks, operate through the entire Tennessee valley, Virginia, North Carolina, Georgia, Alabama, Mississippi, Kentucky and even in Texas and New York. We who have charge of that fleet intend to "keep'em rolling."

Our Transportation Division is in reality a giant car rental or drive-it-

yourself system, operated as a separate arm of the Authority. We cater to the needs of about 5000 potential drivers. The vehicles are requisitioned from the Transportation Division with regular car or truck orders, just as one would rent a car or truck from a commercial rent-a-car agency.

Vehicles are available to various departments of the TVA on a mileage, or hourly rental basis. Light equipment is "rented out" on a mileage basis; heavy, stationary equipment such as power shovels, portable air compressors, etc., is rented out on an hourly basis. A record of the mileage, or time, is kept just as by a renta-car agency, and the cost charged against the department requisitioning the vehicle. The rates are fixed by us, based on the cost of operation of the various types of vehicles and are changed as conditions warrant. We don't try to make a profit, but we try to pay our way, and do so. Any surplus is reflected in lower rates.

Our fleet averaged 2,500,000 miles a month, as of June, 1942. We managed to reduce passenger car travel 45 per cent from February to October, and light truck mileage 20 per cent during that same period. The passenger car and light truck figures

represent a reduction of a million miles monthly travel.

This reduction was accomplished by a review of all transportation needs and a planned pooling of all transportation requests. Every division within the TVA reviewed its vehicular needs with the request that it cut out everything except those considered essential to the war power production of the TVA. Many needs hitherto considered essential and desirable were cut out in the process. Each division was required to submit mileage estimates for the fiscal year and for each month, and these were reviewed by the Budget Office of the TVA. From this review allocations were made and monthly and yearly quotas set up.

Transportation was curtailed to the point of some loss of efficiency, but a lot of rubber is being saved in the process. For instance, light trucks are pooled on major projects, rather than assigned to individuals. Requests for transportation must be made to the pooling officer at the project. He goes over the requests. If he finds that two or more loads are going the same route but at different times, he consolidates the trips into one, disregarding the time element.



and well equipped

Courier and messenger services are handled by common carrier at some sacrifice of service. The reservoir patrol, a vital, protective activity, is being handled on foot, on horseback and by use of small power boats to save rubber-tired vehicles. At main offices, all travelers must send in travel orders in advance to the central pooling office to combine trips, save mileage and the use of a number of vehicles. Constant appeals are made to supervisory groups and to the personnel to save transportation.

The Transportation Division has been in operation since 1933. Our latest figures show how the actual cost per mile of our vehicles has been cut down. For example, here's how our cost per mile in the past three years for stake body, ton-and-a-half trucks stacks up: (fiscal year from June to June).

june)		st Per Mile	
Year	Co	in Cents	Mileage
1940		8.22	416,142
1941		7.27	655,025
1040		6.01	2,192,203

The large increase in mileage in 1942 in all types of vehicles is due to the numerous new war power projects of the Authority. The Authority (Turn to Page 72, Please)

TVA CONSERVATION CUTS COSTS

Budgeting mileage, pooling vehicles, 16 and 24 - hour maintenance and scientific PM program keep 2300 vehicles in Federal warimportant project running at low cost





By
GEORGE H. IRISH CHARLES HUDSON

Chief, Transportation Division and Automotive Engineer respectively, Tennessee Valley Authority, Knoxville, Tenn.



Pole trailer designed and built in the Authority's shops. An unusual feature is the sliding bolster which permits the load bearing point to vary and compensate for the difference between the pole bearing points and trailer tongue hitch. This design has proved successful under all conditions

RUCKS subject to chronic clutch trouble are probably out of alignment some place and should be carefully checked for misalignment before the installation of any new clutch parts. Merely to keep on installing a new clutch plate each time one fails is not only poor practice, from the cost standpoint, but is also one which is wasteful of vital replacement parts.

Too many mechanics fail to take the time to check for misalignment when they are working on a clutch job. Too often a mechanic glances at the clutch plate, and because the facings are worn, refaces or replaces the plate and puts it back in the truck. Then, if within a short time the clutch fails again, he blames it either on the driver of the vehicle or the clutch plate.

It only requires about twenty minutes on the average for a mechanic to make a complete check of alignment; that is the small difference between a satisfactory clutch job and a costly failure.

Clutch failure due to misalignment can often be identified by uneven wear of clutch facings or splines of the clutch shaft and the clutch hub plate. Misalignment causes the clutch plate to wobble and wear against the clutch shaft unevenly, with resulting wear of the shaft splines.

When checking clutch alignment the following points should be given special attention because they are the points at which misalignment occurs:

- 1. Engine mountings.
- 2. Frame and cross members.
- 3. Transmission.
- 4. Flywheel and housings.
- 5. Clutch installation.

Engine Mountings

Check all engine mountings carefully. Defective rubber engine mountings greatly increase the amount of vibration to which the clutch is subjected, and, by throwing the entire engine out of alignment, often causes misalignment in the line of power, resulting in serious clutch trouble. Metal or spring type mountings can cause the same effect when loose or broken.

Check for deterioration of rubber and loose or broken parts and replace where necessary. Be sure that all engine mountings are tight.

MISALIGNMENT CAUSES CHRONIC CLUTCH COMPLAINTS

Alignment is the most neglected factor in clutch jobs. Here's a 5-point, 20-minute check that should help to prolong the life of clutch parts



by JOHN B. YERGER

Technical Editor, Commercial Car Journal

Frame and Cross Members

A bent or twisted frame or cross member will cause misalignment between engine, clutch and transmission, resulting in premature clutch failure. A few minutes' check of the frame and cross members will often save hours looking for clutch trouble actually caused by a bent frame. Check the distance between the front and rear axles on both sides of the truck. If these distances are not the same, the frame or cross member should be straightened.

Loose bolts in the cross member holding the transmission permit undesirable movement of the transmission unit with resulting misalignment. Examine bolts holding cross member to frame and tighten if found loose.

Transmission

Make sure that the bolts which hold the transmission assembly to the bell housing are not loose. If the holts are loose, the transmission will sag and throw the clutch shaft out of alignment. Such a condition subjects both the clutch plate and the hub splines to excessive strains, often causing the plate to bend or break, or the hub splines to shear out entirely or wear excessively. Worn splines cause backlash and grab, and will eventually necessitate a clutch overhaul job. Be sure that all bell housing bolts are tight and that the transmission is properly supported.

Flywheel and Housings

The matings of the crankshaft flange with the flywheel, the flywheel housing with the bell housing and the bell housing with the transmission are most important in alignment of the clutch and mainshaft bearings. If the parting lines are not exactly mated they will cause misalignment of the bearings and therefore the entire line of power, resulting in premature clutch failure.

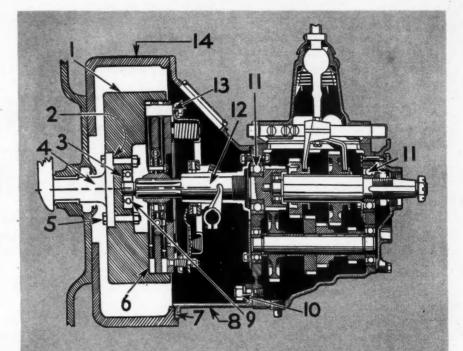
If the flywheel clutching surface, pilot bearing recess or flywheel flange does not run true with the crankshaft, the clutch assembly and flywheel will be thrown out of parallel with the clutch plate. Dirt or burrs between the flywheel and the crankshaft flange also may cause this condition. Both conditions will result in premature clutch failure.

These three surfaces should be checked with a dial indicator gage. If the concentricity varies more than .006 in. on any one of these three surfaces, it indicates serious misalignment, and it will be necessary to check for the cause and correct it.

Examine connection between crankshaft flange and flywheel and remove any dirt or burrs. Machine surfaces if necessary or shim up until alignment is perfect.

If the flywheel housing face or bore is not true with the flywheel serious clutch trouble may result. Check these surfaces with a dial indicator gage. If the dial indicates more than .005 in. run-out, the housing is not in alignment, and these surfaces should be trued up.

(TURN TO PAGE 78, PLEASE)



If clutch trouble recurs, i.e. is chronic, misalignment should be suspected, checked and corrected. Here are the causes and the symptoms:

CAUSES OF MISALIGNMENT THAT RESULT IN CLUTCH TROUBLE

- 1. Misaligned flywheel
- 2. Burrs or dirt between crankshaft flange and flywheel
- 3. Worn bearing recesses
- 4. Flywheel not running true with crankshaft
- 5. Loose flywheel bolts
- 6. Warped flywheel face
- 7. Burrs or dirt between bell housing and flywheel housing
- 8. Warped, bent or cracked transmission bell housing
- 9. Worn pilot bearing
- 10. Transmission mounted loosely
- 11. Main bearings or transmission bearings worm
- 12. Bent clutch shaft
- 13. Burrs or dirt between rim of assembly cover and flywheel
- 14. Warped or cracked flywheel housing
- 15. Defective engine mountings
- 16. Warped or bent frame or cross members
- 17. Misaligned upper and lower sections of housing

CLUTCH AILMENTS THAT ARE SYMPTOMS OF MISALIGNMENT

Distorted or broken clutch plate, or plate hub twisted completely out of discs

Uneven or excessive wear of hub splines

Uneven or excessive wear on splines of clutch shaft

Uneven wear of facings

Vibration, chatter, squeals or howls

Rough engagement

Noisy transmission

Hard-shifting

Rapid wear of pilot and transmission bearings

Uneven wear of release levers

HEN a tire inflated to recommended pressure rolls along a highway under load it flexes. The flexing generates heat. The heat expands the air in the tube and causes an increase in the air pressure. If part of this increased air pressure is let out of the tire in order to bring the pressure down to the recommended figure, the tire is being subjected to a practice that is known as "bleeding."

This bleeding is bad for the tire. That is the unanimous opinion of tire manufacturers. For many years they have been telling truck operators not to bleed tires because field experience and laboratory tests have indicated that bleeding will only lead to premature failure of the tire. Over the years this gospel has gained many converts but even today there are many fleet operators who have

not got religion.

Why do some operators bleed their tires in spite of the statements of tire experts? The only reasonable explanation is that they have been sold so completely on operating tires at officially-recommended pressures that they consider any deviation from those pressures as bad for the tires. So, in order to hold to the officially-recommended pressures they resort to bleeding when there is an increase in air pressure under operating conditions. Some long distance operators are so sold on operating at recommended pressures that drivers are given order to bleed tires at specified intervals.

How Pressure Builds Up

To understand what happens to a tire in service is to understand why bleeding should be taboo in every truck fleet. Briefly, what happens is this:

Starting out at recommended pressure a tire flexes as it rolls along the road surface and this flexing causes internal friction which generates heat. In summer, naturally, the heat build-up is faster and greater than in the winter. The heat that is generated expands the air in the inner tube of the tire and the pressure increases. As the pressure increases the tire becomes harder and flexes less. Because it flexes less it generates less heat to be added to that already built up. Eventually, for a particular speed and a particular load the tire by this natural process ar-

BLEEDING TIRES IS TABOO



With eyes focussed on air pressure alone, operators lose sight of the high temperatures produced that burn life out of tires

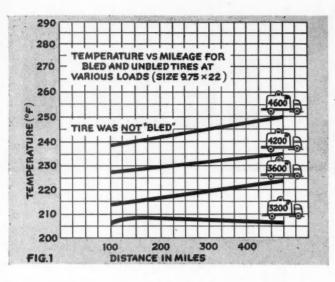
rives at a point where no more heat is generated and added to that already built up, and the increased air pressure also remains constant.

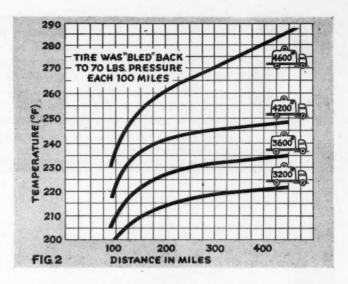
Tires are designed for particular loads and particular recommended starting pressures with the knowledge that in service heat will be generated and air pressure will be increased up to a maximum point which is considered safe for that particular tire.

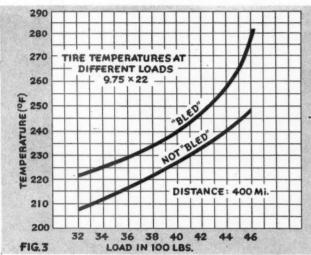
Bled Tires Get Hotter

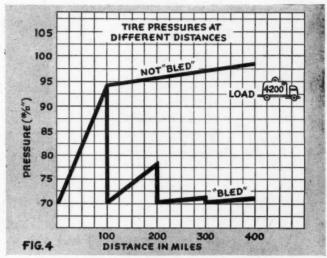
Now let us see what happens when this natural cycle, which the tire has automatically undergone to prevent its being scorched, is tampered with by the practice of bleeding.

Starting at recommended pressure the tire flexes, the temperature increases, the air expands and the air pressure increases. Right here the safety cycle is interrupted and the tire is bled back to recommended starting pressure. The hardness it built up for self-protection is thereby taken from it. It is again as flexible as it was at the start of the run. But the heat that was built up remains. To this heat is added the heat that begins to generate as soon as the tires start flexing as they did originally. The greater increase in temperature again causes an increase in air pressure. The temperature now is greater than if the tire had been permitted to go through its normal cycle. But the air pressure increase has not been as great as it was the first time and the operator, who perhaps reasons that he now is getting the pressure under control, bleeds it again back to the recommended starting pressure. The temperature of the tire keeps mounting and with it the air pressure increases









again, but not as much as before. This is obvious because having been bled out there is less air in the tire than originally and hence less air to be expanded.

High Temperature Destroys Tire

Thus, the effect of bleeding is to build up the tire to a higher temperature than would be the case if it were let alone. This is first degree murder, according to tire manufacturers, because heat is a tire's worst enemy. Nothing destroys tire life more quickly than heat thus generated in service. It causes ply separation and early failure. It causes rapid wear because hot rubber does not have the resistance to abrasion of cooler rubber. It makes a tire more susceptible to impact breaks.

Trouble of another sort occurs when a bled tire cools off due to any The charts shown herewith as Figures 1 to 4 show graphically the effect of bleeding on tire temperature and air pressure. They are the results of tests made with 9.75-22 rayon tires on a Bureau of Standards machine. The tires were run at 115 deg. F. room temperature and at 45 m.p.h., with temperatures and pressures being measured every 100 miles. One of the tires was bled back to 70 lb. air pressure at the time of each temperature reading. Bleeding tests were made under these conditions at loads of 3200, 3600, 4200 and 4600 lb. for a distance of 400 miles at each load. The following conclusion is derived from the data obtained: Bleeding a tire causes it to develop a much higher operating temperature than an "unbled" tire, and the difference in temperature increases rapidly with overload. The higher operating temperature resulting from bleeding reduces the life of the tire greatly. Figs. 1 and 2 show the difference in operating temperature of "bled" and "unbled" tires. Fig. 3 shows the difference in operating temperature at each load used. Fig. 4 shows the variation in air pressure of the "bled" and "unbled" tires.

one of a number of delays that can happen on a long run. As the tire cools, the air in the tube contracts, and because some of the original air has been removed, the tire may be dangerously underinflated for the load it is carrying.

Bleeding Worse for War Tires

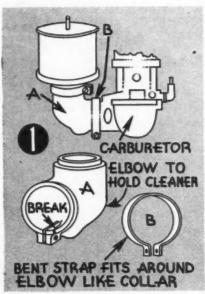
Tire engineers consider it a pity that the effects of bleeding do not show up on the outside of a tire, in a manner similar to the evidences of misaligned wheels. If tiny heat bubbles were to show up on the treads of bled tires it would be a major boon to greater tire mileage.

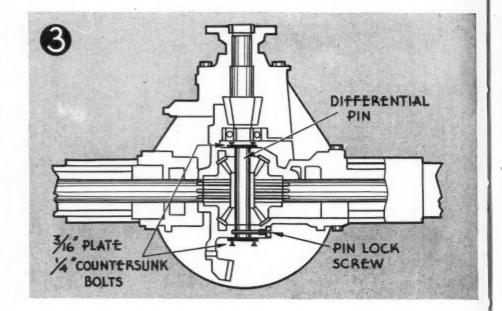
Furthermore, they point out that while the practice of bleeding is bad for peacetime tires, it may be worse for tires of wartime construction, due to the fact that the quality of rubber used is, of necessity, inferior.

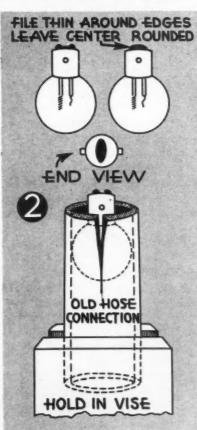
\$5

Commercial Car Journal will pay \$5.00 for acceptable shop hints and \$5.00 for unusual parts salvage tips. Send in as many ideas as you have to the editor. Don't underestimate your ideas. Let the editor be the judge. A photograph or a rough sketch and simple explanation in your own words are enough. CCJ will polish them up for publication. Use this opportunity to earn extra money to buy Victory bonds and help win the war.









1. Salvaging Carburetor Elbow

By Preston R. Coleman Rainey Wood Coke Co., Conshohocken, Pa.

On the Autocar engine an aluminum elbow with a split end for clamping is used to support the Airmaze air cleaner. If you tighten the bolt at the split end too tight the clamping ears are liable to break off. Since these elbows (A) are expensive and aluminum hard to get, we made a steel strap clamp (B) to cover the split end of the elbow. We have found that this clamp can now serve two purposes: first, we have been able to salvage broken elbows, and second, we use it to prevent breaks in good elbows. With this clamp the elbow can be securely tightened.

2. Salvaging Bulbs

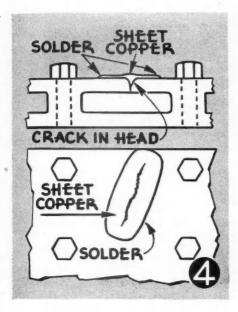
By Charles S. Crawford Atlantic Refining Co., Williamsport, Pa.

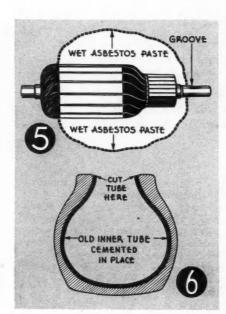
When one filament in a double contact bulb burns out we do not discard it because the use of a little solder will soon turn it into a single contact bulb, suitable for use in turn signals, dome lights, stop lights, or wherever single contact bulbs are needed.

With a small pointed iron puddle the contacts across the center, adding a little solder if necessary, then file down to a smooth rounded surface. This connects the filaments and furnishes a single contact. An old piece of water hose split lengthwise at one end can be used as a very efficient holder for the bulb while working on the contacts.

SALVAGE HI







Then pack the core of the armature tightly with the paste, getting it as close to the worn groove in the shaft as possible. Then braze the worn part of the shaft, using as small a tip as possible, and just enough heat for the brass to flow on the shaft.

After the brazing is complete, unpack the paste from the armature so it will cool off quickly. Turn the shaft down on a lathe until you can make a tight press fit of the bearing on the shaft. Don't be disappointed if it checks shorted on a growler, give it a chance to dry out first. I have repaired four armatures by this method and have had good results from all of them.

3. Differential Pin Repair By F. W. Green, Oshkosh, Wis.

On some trucks we have experienced trouble with the differential pin lock screw breaking and allowing the differential pin to work out and hit the pinion pilot or rear bearing, resulting in damage to all parts in the carrier housing.

To overcome this trouble we fastened to the differential case two 3/16-in, plates, one at each end of the differential pin. The plates are held in place by 1/4-in. countersunk bolts. If the lock screw breaks, the plates will hold the pin in place, and thereby prevent any damage to the differential.

4. Salvaging Cylinder Heads By Harry Edge, Philadelphia, Pa.

When a crack appears in a cylinder head a temporary repair which seems to last very well, when welding equipment is unavailable, can be made by cleaning the crack out thoroughly and filling it with solder. Then a strip of sheet copper, picked out of the scrap pile, can be soldered over the top of the crack and it will be water tight. The point is that the sheet copper will stretch enough to allow for the head expansion and consequently will not pull loose. This repair is good for iron heads.

5. Repairing Armatures

By Walter Fraas Gambe-Robinson Co., Lincoln, Neb.

Here is a method which I have used in repairing a generator armature shaft when the bearing became loose on the shaft and cut a groove in it. Take about one pound of flake asbestos and make a wet paste of it.

6. Salvaging Tires

By Harold C. Ladwig Wolf Truck Lines, Watertown, Wis.

Having several tires with loose cords and small breaks on the inside of the casings, we devised a method of repair which allowed us to get some more mileage from them.

First we cleaned the inside of the casing thoroughly with gasoline and then gave it a coat of rubber cement. We then took an old inner tube, one size smaller than the casing, cleaned the tube with gasoline, and put it inside of the casing. The tire and tube was then mounted on the rim and inflated with air, and allowed to stand until the tube was thoroughly dry in the casing. The tire was then deflated, taken off the rim, and with a sharp knife, the tube was trimmed along the inside edge of the tire head. The tire and tube were then remounted on the rim and inflated. These tires have given us very satisfactory results so far.



PUBLICATIONS



VALUABLE AIDS FOR FLEETMEN

A selected list of the latest literature — books, pamphlets and catalogs — intended to help fleet operators solve maintenance and operating problems. They are more valuable today than ever before. All are free. To get your copies simply fill in the numbers on the postcard and mail. No stamp is needed.

L72. Diesel Engine Design

Every operator owes it to himself to know what is being done to insure a better after-the-war diesel engine. Offered free to CCJ readers is a new 32-page illustrated booklet entitled, "Threshold to the Future," which shows how scientific research is helping to build a better diesel. The booklet should prove of interest to every operator who is using or contemplates the use of diesel equipment, as it shows how the diesel of the future will do his job at a lower cost, over a longer period, with less maintenance and service. Write L72 on the postcard for your free copy.

L73. Truck Decais Free

Here is a real opportunity for every fleet operator to cooperate with the government in selling more War Bonds and Stamps. Offered free are decalcomanias advertising the sale of Bonds and Stamps which can be easily and quickly adhered to any trailer or truck. These 13 in. by 13 in. emblems are weatherproof and will add greatly to the appearance of any unit, regardless of lettering or paint job. The decals are in the form of an American eagle flying in full wingspread position with a shield securely grasped in his claws. The wording on the shield reads, "Protect America. Buy U. S. War Bonds and Stamps."

Be patriotic, display this emblem, make your trailer a moving billboard for Uncle Sam. Write L73 on the postcard for as many of these patriotic decals as you can use.

L74. Electric Drill Care

Here is a handy little booklet for fleet operators, telling all about electric drills, their proper use and care. It is designed to show new workers the correct methods of using electric drills, and obtaining greatest efficiency and longest life from these important tools. The booklet covers such points as assembling the drill, the switch control, drill chucks and bits, how to use the drill, and several important points on user maintenance and care. Every operator should have a copy of this booklet for his shop file. Write L74 on the postcard for your free copy.

L75. Expander Ring Facts

How expander-type piston rings help to prevent excessive cylinder reconditioning, and thereby contribute to the parts conservation program, is fully explained in a 12-page booklet now available to all fleet operators.

The data for this booklet was taken from a committee report of the SAE-ODT on Transportation and Maintenance Activity. The report represents the experience of fleet operators who have used expander-type rings, and the experience of individuals closely connected with fleet operation, and with the application and performance of piston rings.

This booklet should prove of help to operators in effecting time and parts saving maintenance methods. Write L75 on the postcard for your free copy.

L76. Truck Engineering Manual

Here is an opportunity for fleet operators to secure a copy of one of the best maintenance and reference manuals ever offered to CCJ readers. This manual entitled, "Trucks and Buses, Fuels and Lubricants," contains 111-pages of valuable engineering data. It covers the entire field of maintenance and operation, including chapters on engines, power drives and axle suspensions, steering gear, brakes and braking systems, shock absorbers, accessory equipment, motor fuel, motor oils, chassis and gear lubricants, preventive maintenance, recom-

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mended fuels and lubricants and truck and bus engineering data. Each chapter is well illustrated and covers the subject in an exhaustive manner.

Although the title of fuels and lubricants might suggest that the manual deals only with these subjects, such is not the case, as every unit of a vehicle is illustrated and its operation and care fully explained. This manual should prove a splendid reference, and also valuable for use in any mechanic training program.

Due to the great cost of preparing this manual and the limited printing, it is restricted in distribution to army, navy, marine and fleet operators for reference purposes, or to officers in charge of groups. Do not miss your chance to get a copy of this valuable manual while the supply lasts. Write L76 on the postcard for your free copy.

L77. 1943 Calendar

A new Miss Federal greeted us as 1943 settled down to business. This year the Miss Federal calendar is not restricted to providing a lovely girl illustration plus a daily date record. Its usefulness goes farther in presenting a valuable Weights and Measures Table of trucking payload items—a time-saving, ready reference covering every type of material and product hauled by truck. The usefulness of this chart which covers everything from apples to slag, providing cubic displacement and weights, should find ready acceptance by truck owners, operators, business firms and shippers.

Qualified truck operators and motor transportation men may obtain this beautiful 10-color calendar without charge or obligation by writing L77 on the postcard for your free copy.





NEW PRODUCTS

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P79. Fire Extinguisher

The General Detroit Corp., Detroit, Mich., has added carbon dioxide extinguishers to its regular line of fire fighting equipment. The model illu trated is known



as the C-D Fog and is of 15-lb. size. Its unusual structural features are based upon the engineering developments of the Fire Guard line, rapidly dicharging the carbon dioxide and killing the fire quickly by penetrating to every corner where fire exists. C-D Fog is approved by the Underwriters, classified as a nonfreeze, non-conducting, oil and flammable extinguisher. Because of its light weight, its use is not confined to the

garage but may be carried on the trucks.

Use free postcard for more details

P80. Heavy Duty Lubricating Oil

Gulf Oil Corporation has just announced a new brand of lubricating oil which it calls Gulf Dieselube H.D. (Heavy Duty). This oil, made to meet U. S. Army specifications for lubricating internal combustion engines, is designed for ground equipment such as trucks, tanks and jeeps. It also has been approved by the leading manufacturers of Diesel engines.

Reports on heavy-duty Diesel engine

FOR FLEET OPERATORS

The latest in shop equipment, supplies, replacement parts and accessories developed by manufacturers for fleet operators. For more details of any product described, fill in the number on the postcard and mail. No stamp needed. Also use the postcard for additional information on any product advertised in this issue.

tests, conducted by Gulf Research & Development Co., Gulf Oil Corp. research subsidiary, show this oil to be remarkable in engine cleanliness and lack of ring sticking. It also is recommended for gasoline engines in commercial equipment, where service is extremely heavy, to overcome ring sticking, lacquer formation, and bearing corrosion.

Use free postcard for more details

P81. Tire Spreader

A new product to aid in the rapid inspection of tire casings under the OPA program is offered in the Bear Jiffy Tire Spreader by the Bear Manufacturing Company, of Rock Island, Illino's. The new spreader can be used on the floor, curb or bench, thus eliminating the hoisting of heavy tires. The tire is rolled onto the spreader, grips adjusted to the tire bead and the casing spread. Spreading mechanism is equipped with a self-locking device. The spreader is made in two models, one



for passenger cars and the other for trucks and buses.

Use free postcard for more details

P82. Portable Sander

Sterling Tool Products Company, manufacturer of portable oscillating sanding machines, announces the new Sterling 1000 electric sander designed and built for heavy duty service.

Some of its outstanding features include a fully streamlined balanced and counter-



balanced vibrationless unit, compact size, a handle designed to fit the hand comfortably of either men or women operators, and a snap action switch located on handle convenient to operator's thumb.

A quickly detachable sanding pad, operated by simple latch type lock, takes 1/3 sheet of standard abrasives and is made flexible to permit sanding on curved or flat surfaces. Tumbler action clamps operated by key, screwdriver, etc., lock brasive sheets on sanding pad.

New orbital motion sanding action produces maximum cutting, and leaves a completely smooth, sanded surface on wood, composition or metal.

By using a felt or cloth matrix on sanding pad, the Sterling 1000 will also do many lapping and polishing operations.

Use free postcard for more details

(TURN TO PAGE 120, PLEASE)

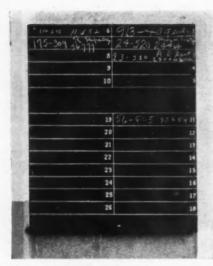


Fig. 1. Blackboard designed to save time in locating trucks due for check-up on PM schedule

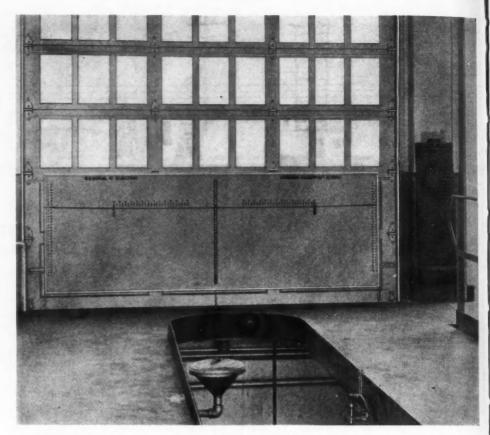


Fig. 2. Headlight focusing screens are permanently fastened to the inside of the front overhead doors

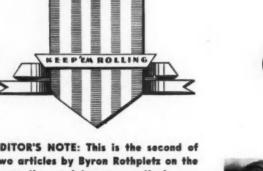


EDITOR'S NOTE: This is the second of two articles by Byron Rothpletz on the preventive maintenance methods employed by the Atlantic Refining Co.

The first article, which appeared in the October, 1942, issue of Commercial Car Journal pointed out that the first step in the company's PM program was a regular washing schedule of all vehicles. The streamlined system developed to do this job cleans tank trucks in an average of four minutes.

The next step, as pointed out in this article, is a thorough and definitely scheduled program of mechanical check-ups and adjustments. Because it is unusually comprehensive, this schedule is reproduced in its entirety in the following pages.

Fleet operators also will be interested in Mr. Rothpletz' comments on major repair work which is not included in the regular PM schedules, but rather, handled as the need arises.



COMPLETE PM IN



Byron Rothpletz

OUR lubrication and preventive maintenance bay, shown at Fig. 3, is 60 ft. long, and contains five lubrication pits each 55 ft. long. 31/2 ft. wide, 41/2

ft. deep, with steel guard plates 5 in. high. Every pit is equipped with 10 lights, three oil drain funnels, three hose to supply chassis lube at 5000 lb. pressure and two hose to supply gear oil at 1000 lb. pressure. Each pit is equipped with manually-operated overhead doors at each end.

Headlight focusing screens are permanently fastened to the inside of the front overhead doors, as shown at Fig. 2. This is a convenient and time saving arrangement, as headlights are checked at every inspection. It is only necessary for the inspector to lower the door and the screen is ready for use.

Each pit is also equipped with all the necessary hand guns, oil cans, and motor oil storage tanks needed to take care of all the different lubricants used on the various units of our trucks.

We employ three inspection mechanics and three lubricators on our first shift, which works from 4 p.m. to 11.30 p.m. The second shift is composed of four inspection mechanics and four lubricators, who work from 11.30 p.m. to 7 a.m. These men average 20 to 22 lubrication and maintenance jobs each night. We furnish the complete tool equipment for all of our men.

A simple system has been devised

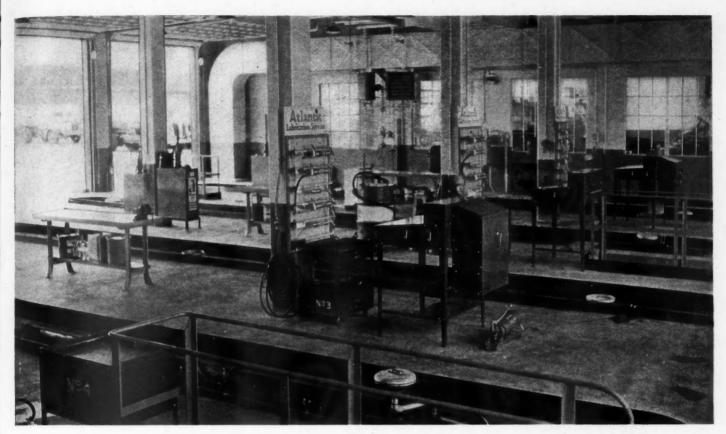


Fig. 3. A general view of Atlantic Refining Co.'s 5-pit lube room. This is one of three modern sections of the new lubrication and PM bay

10 STEPS

to conserve time in locating trucks scheduled for preventive maintenance. Before we worked out this system, chauffeurs would park their rigs anywhere on the lot and it would be up to us to search for the ones that were scheduled for service. Frequently, when the scheduled rig was located, it would be surrounded by others which would have to be jockeyed around to free the vehicle we wanted. It was nothing unusual for a man to spend half an hour locating a rig. All that waste has been eliminated. We have marked off the parking lot in numbered sections. The driver of a scheduled truck now picks out any vacant section, parks his vehicle, walks into the lubrication bay and chalks up his truck's number on a blackboard opposite the number of the parking section. Locating



Eastern oil refinery operator eliminates guesswork in his PM program by devising a 10-part "blueprint" of service procedure

by BYRON ROTHPLETZ

Superintendent of Maintenance, Philadelphia Garage, Atlantic Refining Co.

the truck is reduced to the simple task of looking at the blackboard, shown at Fig. 1.

The schedule of our "Preventive Maintenance with Lubrication" is based on increments of 500 miles in which regular lubrication of the truck is the main point around which the maintenance is centered. The program is arranged to complete all the necessary preventive maintenance

(TURN TO PAGE 80, PLEASE)



Apex Laundry's "Covered Wagon" trailers have caused much favorable comment. Using a minimum of vital materials, this vehicle has long paid for itself

1-WHEEL TRAILER: 1000 LB. PAYLOAD

Laundry fleet operator converts \$45, onewheel, farm trailer chassis to provide more service without increasing mileage

by L. H. HOUCK

RATIONING clouds are not noted for silver linings, but A. Hattendorf, president, and I. J. Whitescarver, secretary and treasurer of the Apex Laundry, Memphis, Tenn., have successfully extracted sunbeams from transportation cucumbers with a one-wheeled trailer which adds 1000 pounds of pay-load to their overworked trucks.

The new unit, born of necessity, is a canvas-covered vehicle much after the fashion of the wagons of the pioneers, and is such a striking appendage to Apex trucks that it

caught the public fancy and is known far and wide as the Apex Covered Wagon.

It had its beginning when a onewheel trailer chassis was bought, consisting of only the one wheel and its mounting accourtements and two drawbars. It was a standard unit of merchandise; designed and sold principally for farm use, so farmers could make their own bodies.

Apex mechanics built a base and some bows such as were used on old time prairie schooners, over which was stretched heavy brown canvas. Tests showed its load capacity was 1000 lbs. Cost of the one-wheel chassis was \$45. Canvas cover, bows and other gee-haws added \$15, making a total, ready-to-roll price of \$60.

The trailer is attached to the truck by two straps which fasten to the ends of the rear bumper. The single wheel uses a 4.00x8 tire, which is a regular wheelbarrow size in common use by building contractors and construction companies. The tires are readily obtainable even under present rubber conditions.

The success of the first unit was phenomenal. The canvas cover, which kept the weight low and permitted more load, proved ideal for keeping out dirt and grime of the road. It was used for bringing back an extra thousand pounds of dirty clothes by routemen on their return trips. The flexible canvas body made it practical to fully load the vehicle.

Officials of Apex were surprised when inquiries started pouring in from other firms who had heard about the trailer. They gave out all the information asked and soon many other firms, including another Memphis laundry, had put the one-wheel unit into service with their fleets.

Apex now has three of the trailers in service and they are making from three to five trips each week. At first they were used only for picking up unfinished bundles but later they were utilized for both pickup and delivery.

On some routes it was found practical to take the trailer only a part of the entire route. For instance, the

(TURN TO PAGE 78, PLEASE)

Canada stopped making trucks before Pearl Harbor, and started gas rationing early in 1942. Truck owners are faced with serious difficulties in obtaining parts, tires and manpower.

To insure the availability of these essentials, Canada's Wartime Prices and Trade Board is encouraging and aiding truckers in pooling vehicles and facilities; restricting and zoning wholesale and retail deliveries; limiting the delivery hours. Wages and tariffs were frozen since Dec. 1, '42.



ARTIME restrictions to conserve essential supplies and manpower are rapidly changing the role of the truck in Canadian life. Deliveries of many civilian commodities are now limited by truck, private trucks are limited in their movements to 35 miles from their registered address, and for-hire truck firms may not add to their fleets nor may new for-hire fleets be started except for exclusive war work.

For the first two years that Canada was at war, the trucking business expanded for both civilian and war transportation needs. Canada stopped making new trucks before Pearl Harbor, but since that date the restrictions on the trucking industry in Canada have been coming fast. Similar to truckers in the United States, Canadian truck owners are now faced with difficulties in obtaining parts and equipment for their trucks and trailers; with priority demands on tires; with limited quantities of gasoline. The trucking business in Canada has increased since the war began; only in recent months has there been a slight decline in total trucking business, a decline which is bound to grow as restrictions now in force and contemplated cut the number of truck miles operated.

With Canada's nine large provinces having eliminated as unnecessary, in the past, an organization similar to the Interstate Commerce Commission, such a body had to be set up to put into force the wartime controls which were felt necessary. The use of all trucks is accordingly under the jurisdiction of the Services

CANADA'S WARTIME TRUCK CURB

Faced with same shortages as U. S., operators pool their facilities, limit hauling distances, freeze wages and tariffs

by JAMES MONTAGNES

Administrator of the Wartime Prices and Trade Board set up in December, 1941, when price ceilings went into effect in Canada. Similarly gasoline, tires and automotive equipment has been placed under wartime controllers of the Department of Munitions and Supply. These two bodies now control all trucking operations in the Dominion. They are headed by business men on loan to the government for the duration. All truck operations come under the Services Administrator of the WPTB, a banker,

James Stewart of Toronto. He is assisted in truck operations, one of a number of services under his control, by W. H. Male, of Direct-Winters Transport, Ltd., Toronto, a well-known executive of one of Canada's largest for-hire truck fleets.

First restriction to hit Canadian truck owners was that of new models. There have been no new car models made in the Dominion since 1940. What cars were made for civilian use were of the 1941 model, and none

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E. N. Hatch



Brig. Gen. J. Kirk

S.A.E. REPORTS

ON:

- * Mechanic Training *
- * Preventive Maintenance *
 - * Substitute Materials *
- * Oil vs Cylinder Wear *
 - * Bearing Corrosion *
 - * Military Problems *

Digests and discussions of papers on subjects of current interest that held the spotlight at annual meeting of engineers

TRAINING MECHANICS

by Floyd Patras,

Southwestern Greyhound Lines, Inc.

This paper discussed the training program necessary to develop a skilled general mechanic. It covered, as far as possible, the items essential to the development of a skilled mechanic, who upon the completion of his training, would be expected to possess the ability to: diagnose trouble, to make all such adjustments and repairs as are necessary for the proper and safe operation of a motor vehicle.

The plan of training, should be carried out by an employer under the auspices of the U. S. Department of Labor under the Smith-Hughes, George-Deen Acts. The program should be carried out entirely by the employer or by the employer working jointly with a local trade school. A definite number of hours should be provided for correlated technical instruction, and it will be necessary to have a competent instructor for this work.

The first few months of preliminary instruction should indicate to both students and instructors just which ones have the faculties necessary to become all-around mechanics and the general directions to be taken by each of those who would specialize.

Students who fail to show reasonable aptitude for learning or who obviously are not interested should be eliminated at the end of a reasonable period, perhaps the third month.

The plan as outlined calls for preliminary instruction of students in shop house-keeping, such as cleanliness and keeping everything in its proper place, safety, care of hand tools and equipment, identity of tools, nuts, cap screws, studs, etc., by name, type and size.

As to the training methods to be used, the program calls for the use of films for basic introduction to specific units of a vehicle, then while the information given in the film is still fresh in the student's mind, he must be afforded an opportunity to disassemble the unit covered by the film.

The program as planned is broad in scope, and covers the actual necessary shop work connected with the repair operations of approximately seventy-five types of repair jobs.

(Ed. Note—This paper was an S.A.E. Committee report.)

★ DISCUSSION ★

Gavin Laurie, Atlantic Refining Co.: This paper is a long-time training program rather than a short-time one for current

war-time needs. Any women trainees must start from scratch, with very little auto-motive background. In training mechanics for a large fleet, a good sequence of instruction would be: 1. Start the apprentice in the tool room; 2. Next put him on the lubrication rack; 3. Have him work with other mechanics. It is doubtful whether 20 per cent of the mechanics in a shop have the all-round knowledge covered in this paper. But they do have the know-how to make repairs. Such a program is better for supervisory personnel. The Army is training many mechanics who will be available in the post-war period. He doubts the necessity of instructing the mechanics in the principles of automotive engineering.

J. W. Lord, Atlantic Refining Co.: Wall charts for training mechanics are not always practical. The value of slide films also is doubtful because there is no guarantee of student attention in a darkened room and they do not lend themselves to maintenance instruction because there are no reference possibilities. There is a need for development of a mechanic training program by the manufacturers. The government's Training Within Industry program has been valuable in breaking down jobs into their fundamental parts.

F. C. Patton, Los Angeles Motor Coach: This program is too detailed for the general run of potential mechanics. There is need for use of line drawings such as those used in the aircraft industry to show students the sequence of service operations. This instruction should start in the high schools.

Dean Abner Fales, M.I.T.: A good foreman does not necessarily make a good instructor. In the transport training schools set up after World War I to fit men for civilian jobs, it was found that the "dime novel" technique of expression was best in telling them how to perform various service operations. Simplicity was the keynote. Possibly this training of instructors might be carried out through university extension courses.

Brig. Gen. S. G. Henry, Armored Force School, Fort Knox, Ky.: The aircraft engine rebuilding plant at Hill Field, Utah. uses girls with no mechanical background. These girls learn progressively the washing of parts, inspection, use of gages, until in three months time they are qualified engine rebuilders, installing engines in planes such as the B-17. The keynote of instructing mechanics is breaking down the job into its component parts. No automotive part assembly job should take more than a week to master. The habit of good workmanship should be instilled. The Army teaches through repetitive operations. And the mechanics learn to service equipment under field conditions. This is equipment that has been actually used in the field rather than school equipment in which the parts fit easily after many classes have been over the same operations. A good motto is "Keep it simple." Fort Knox is training mechanics at the rate of 76,000 men a year, graduating 200 every day.

PREVENTIVE MAINTENANCE AND INSPECTION

By E. N. Hatch,

PROCEDURE

American Brakeblok Div.

American Brake Shoe and Foundry Co.

Under present day conditions, it is absolutely essential that the best methods of preventive maintenance and inspection procedure be continually practiced to keep all vehicles now in existence operating.

When we had plenty of mechanics who had grown up with a particular system, much of the system was carried in the heads of the workmen and supervisors, because it had been developed gradually and much of the instruction was never written down. Now with a mechanic shortage we have to start training men in the specific procedure of repairing or inspecting a given unit or part.

To simplify this training there is a real need for a standard basic plan, which is as simple as it is possible to develop, and still fit the demands of all fleet operations, large and small.

It is necessary that a schedule be set up by assemblies showing maximum and minimum periods of inspection, based on mileage or any other unit of wear, with time limits on some items such as changes in grade of lubricant due to seasonal requirements. Between these maximums and minimums the operator could choose an interval to suit the conditions, standards, and the requirements of the times.

The general term "inspection," or "check," has been used in most maintenance instructions. If you have a trained personnel, who know what you want done when you call for a vehicle or unit to be inspected, you are indeed fortunate. However, in designing a basic Preventive Maintenance and Inspection Procedure, we must not presume too much, but attempt to be as specific as possible without losing the necessary flexibility. In place of the common term "inspect," or "check," we propose the following common functions: A-Adjustments, T-Tests, O-Oil, Lubricate or grease, L-Light or visual check-up, H-Heavy or physical inspections and repair, R-Replacements, rebuild or recondition.

One or more of these common functions of maintenance can be applied to every part of the vehicle. In order to simplify the preventive maintenance and inspection procedure to a workable basis, it seems necessary to have an index in chart form for instant reference. Dividing the vehicles into groups, systems, units, parts and functions, and assigning a number and letter to each item in an alphabetical system, gives the desired flexibility, whereby new units, parts, or items can be added as new designs are made available to the operator.

There are fifteen groups: Axle-front, Axle-rear, Body and cab, Brake System, Clutch, Cooling System, Electrical System, Engine, Frame, springs and mounting, Fuel and Exhaust System, Special Equipment, Steering System, Transmission, Propeller shaft (or drive line), Wheels, rims and tires.

Under each group the item to be considered for preventive maintenance and inspection procedure has been listed alphabetically and given a letter and number. This provides the desired flexibility whereby new items can be added to their proper group under the proper alphabetical letter by adding the next number.

This basic index, although relatively short, covers practically every item that has been used on all the maintenance systems that are available. By the use of this basic index, and the common functions, such as adjustments, etc., we have been able to tabulate what has been done, and when it was most generally considered necessary.

(Ed. Note—This paper was an S.A.E. Committee report.)

★ DISCUSSION ★

Joe Harvey, Pittsburgh Motor Coach: Whereas in 1928 a 1500-mile inspection interval for buses was standard, now it has been extended to 2500 miles. A check sheet on maintenance operations should be kept right in the shop. It may get dirty there but it serves a more useful purpose than a clean check sheet in the office which is not checked by mechanics. It is better to keep maintenance forms to a minimum and have them arranged for check marks because the less writing a mechanic has to do the better it is for the shop.

H. L. Eberts, Small Electric Motors, Ltd., Canada: Parts like carburetors, spark plugs, distributors, fuel pumps, and diesel injectors need expert service so a mileage basis of inspection is best. If the part is allowed to run until there is a road failure, it may prove a real handicap as the vehicle may not be accessible to competent service facilities. The life of diesel injectors has been lengthened with improvement in fuel, from 4,000 to 8,000 miles, so a mileage basis of inspection must be kept up to date. There are 27 models of generators so a different mileage inspection standard for each model may have to be set up.

Fred Faulkner, Armour & Co.: There is need for a bread and comprehensive preventive maintenance program, especially (TURN TO PAGE 98, PLEASE)



CHECK AIR LOSS BEFORE INFLATING

Surveys and tests indicate that checking tires periodically to determine comparative air loss reduces failures and adds miles

EXCLUDING sudden failures, such as blow-outs, air in a tire escapes in either or both of two ways:

1. Leakage through the valve.

2. Slow leaks through punctured holes caused by nails, glass, pinched tubes, etc.

The first group of leaks is easily detectable and preventable. The second is unpreventable but detectable.

The secret of long, trouble-free tire service will be found in the common denominator of the basic facts above—the detectability of all leaks, preventable or unpreventable. Air pressure leaks cause underinflation and underinflation is a tire's greatest single destructive agent. The means for detecting air leaks is, of course, the tire pressure gauge—an instrument well known by all having any contact with automotive vehicles.

On the surface, the statements above may appear to be a rehash of "old stuff" in the fundamentals of

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	BIGHT (E	use	EIGHT NAS		COUT ON		BIGHT BEAR		COURT DEAR		1	
	FBONE	FRONT	PIOE	106	SIDE	SIDE	SIDE	SIGE	SIDE	SIDE	,	d.
CORRECT TIRE PRESSURE	70	70	70	20	20	20					20	
12/4/42	69	68	69	69	68	60					69	
12/1/42	69	68	68	69	69	6	4-1	res			69	
12/10/42	6	69	66	69	69	69					68	
12/13/42	69	68	0	68	69	69		Fire			69	
12/14/42	68	69	69	68	69	69		_			69	

Fig. 1. Schrader survey proved that the true picture of a tire's condition could not be had unless pressure readings were taken before inflation. This form shows abnormal air losses that proved to be caused by punctures. Normally, they may not have been discovered except by road failure. This system prevents underinflation, and prolongs tire life

tire care. Actually, they are the basis of a new five point tire inflation program developed by A. Schrader's Sons, Brooklyn, N. Y. The program was developed after various tests and surveys were conducted to determine the amount of air loss prevalent in tires and how to correct the condition to increase tire life.

The heart of the new program is a new procedure called "Comparative Air Lost Test" which gets right down to the root of underinflation. It employs known methods and instruments but reverses the prevailing practices and, thereby, establishes a new procedure. The fundamental point of the new procedure is: Determine a tire's air loss before inflation. A sound tire will not lose much air. Where there's excessive air loss, there must be a reason.

For example, abnormal air loss in a tire clearly indicates a leaking tube and merely inflating the tire to the recommended pressure will not remedy the cause of the air loss. Unless the reason for the air loss in a tube is found and corrected, the tire will be operating continually in an under-inflated condition. This, of course, results in abnormal tire wear, and undue strain on the sidewalls, which may result in a road failure or even ruining of the tire.

Schrader used various sources to provide test data which, in addition to the surveys, were used as the basis in formulating the new program and, particularly, the new inflation procedure. The sources and the findings were:

1. An initial survey of 500 vehicles at parking lots and garages where (Turn to Page 108, Please)

AT THE fourth Annual meeting of the National Council of Private Motor Truck Owners, Inc., held in New York on Jan. 19 and 20, topics of vital importance affecting 1943 wartime operations of private carriers were discussed. Responsible government officials spoke on curtailment and conservation problems, and how the private motor truck owner can do his share to help win the war.

Among the more interesting topics covered at the conference were: Tire eligibility and rationing, truck maintenance, state legislation, certificates of war necessity, manpower problems and many other emergency problems that confront private carriers today.

Grean Elected President

At a meeting of the Board of Directors the following were elected to office in the National Council of Private Motor Truck Owners, Inc.: President, A. M. Grean, Jr., of Ward Baking Co., New York City: eastern vice-president, G. W. Laurie, Atlantic Refining Co., Philadelphia, Pa.; central vice-president, O. A. Brouer, Swift & Co., Chicago, Ill.; western vice-president, P. Arnold Anderson, secretary, Private Truck Owners Bureau of California, San Francisco; southeastern vice-president, E. M. Fetherston, Jr., Colonial Stores, Inc., Norfolk, Va.; treasurer, Robert C. Hibben, International Assn. of Ice Cream Manufacturers, Washington,

War Advisory Committee Report

In his report, Mr. W. H. Ott, Jr., chairman of the War Advisory Committee, gave an account of the activities and accomplishments during the past year. He pointed out that, since most of the war regulations affecting commercial vehicle operation are under the jurisdiction of the Office of Defense Transportation, the Committee's principal contacts and activities were in connection with regulations issued by that agency.

The Committee, he said, has gained the recognition of the Office of Defense Transportation to the extent that that agency's early policy of issuing orders without preliminary consultation with affected groups has been set aside. The Council group is now being given opportunities to confer with ODT officials as to the practical effects of proposed regulations before action is taken.

PRIVATE CARRIERS' WAR CONFERENCE

National Council discusses wartime problems of Private Carriers and hears Government officials stress the need of solving the maintenance and manpower problems that affect them

Tire Eligibility and Rationing

Charles F. Phillips, Chief, Automotive Supply Rationing Division, OPA, gave his views on the tire situation. He said that the rubber situation is tight and probably will get tighter.

"It is our problem," he said, "to see to it that essential trucking continues, and this can only be accomplished by strict conservation of our present rubber supply.

"The truck tire quota for this year will be 400,000 tires per month, but this amount will not even take care of all the trucks in the essential classication."

Mr. Phillips also declared he did not think it wise to put any more classes of trucks in the eligibility list, when it was impossible to take care of the requirements of the trucks already in that list.

"Let me emphasize," he said, "the fact that we must live within the quota of rubber available; that is the only goal of the OPA. If we fail, then soon even essential trucks will be off the roads. But essential trucking must continue. This can be accomplished by mileage rationing, control of loads and speeds, tire inspection and tire maintenance.

"The tire supply problem for trucks cannot be solved as easily as for passenger cars. Truck tires require a higher proportion of crude rubber—a minimum of 40 to 65 per cent. Moreover, the reclaimed rubber being used for passenger car tires is not suitable for truck tires." As a

result, Mr. Phillips declared, every truck tire made causes a serious drain on the critical rubber stock pile. He asked the cooperation of private carriers in carrying out such tire conservation measures as would ensure continuous operation of essential trucking.

Cumming Stresses Maintenance

In his address, Mr. William J. Cumming, Chief, Vehicle Maintenance Section, ODT, stressed the importance of parts conservation and discussed the use of metal coating.

"Metal coating," he said, "has been proved by many operators to be adaptable to the reclaiming and conservation of many parts which, otherwise, could not be saved."

He also stated that all operators should intensify their preventive maintenance programs with a view of conserving all parts.

On the subject of procuring an adequate supply of parts to keep vehicles in proper repair, he said, "the controlled materials plan of the WPB should improve the parts situation. Under this plan the manufacturer will get his share of raw materials to make such parts."

Director Rogers' Views

John L. Rogers, who heads the Motor Transport Division of the ODT, spoke on several matters of vital interest to the private carriers. He said that it is the responsibility of everyone in the industry and govern-

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ODT NEWS

(The List of Joint Information Offices will be found on page 124)

Truck Tire Inspection Date Postponed to Feb. 28

On Jan. 12 the ODT postponed the final date for initial commercial motor vehicle tire inspections, as required by General Order ODT No. 21, from Jan. 15 to Feb. 28, 1943.

After the initial inspection is made, the vehicle must then be regularly inspected every 60 days or every 5,000 miles, whichever occurs first.

Cleveland Dairies' Joint Plan Approved by ODT

A joint action plan for every-other-day retail milk deliveries, submitted by 81 Cleveland, Ohio, dairy companies who do approximately 95 per cent of the retail dairy business, was approved by the Office of Defense Transportation. The plan will remain in effect for the duration of the war.

Under the plan, a proponent is prohibited from making a delivery to any customer who has received a delivery of dairy products from any of the other proponents during the previous 48 hours.

First Coal Dealers' Plan Ok'd

Approval of the first retail coal dealers' joint action plan, which will pare an estimated 135,000 truck miles annually off the delivery operations of 17 Chicago retail coal dealers through cooperative use of truck and yard facilities, was announced by the Office of Defense Transportation.

Members may deliver coal from each others' yards and use each others' yard services and trucks to reduce cross-hauling. Specific charges are provided for in the plan.

More Frequent Deliveries of Fresh Vegetables Allowed

To facilitate the unloading of refrigeration cars engaged in the movement of fresh fruits and vegetables, the Office of Defense Transportation has issued General Permit 17-19 which will allow produce trucks to make more than one delivery a day between freight terminals and wholesale produce markets, and to make such deliveries partially loaded. The Permit also allows more than one delivery between a terminal or a market and the "premises

of any consignee at one point of destination," but in making such deliveries the vehicles must carry capacity loads.

Ideal Truck Reports Requested

The Office of Defense Transportation issued a reminder to owners of commercial motor vehicles that all "idle" trucks, buses, and other vehicles—except taxicabs, rental

cars, ambulances and hearses—must be reported to the ODT.

Owners are required to list all commercial motor vehicles which were idle during the last 14 days of the month.

Reports should be made on ODT form CWN-3, a simple, single-sheet form of only eight questions which can be obtained from and should be returned to the vehicle owner's local ODT District office.

Certain Trailers Need Not Carry Certificates

Exemption Order ODT 21-4—§521.3503
Partial exemption of certain special trailers. Platform trailers, pole trailers, house hauling trailers, boat trailers, transformer oil tank trailers, live electric line tool trailers equipped with solid rubber tires or pneumatic tires, and other rubber-tired trailers the structure of which makes it impracticable to mount or otherwise carry on the vehicle the Certificate of War Necessity or fleet unit certificate pertaining thereto, are hereby exempted from the provisions of paragraph (c) of § 501-93 of General Order ODT 21, as amended: Pro-

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NOTICE

To Employers, Employees, and Labor Representatives of the Motor Transport Industry

On December 17, 1941, representatives of labor and industry met in Washington and agreed that there would be no strikes and no lockouts for the duration of the war.

In the main, employers and employees in the motor transport industry have lived up to this agreement. Nevertheless, there have been numerous blots on the record.

Any stoppage of transportation service, however short, is a threat to the continuous production which is essential to the security of our armed forces and the safety of our country. With orderly procedures for settlement available, no disputes between employers and employees can justify such action.

Executive Order 9017, issued by the President on January 1, 1942, sets forth these procedures for the adjustment of labor disputes:

The parties shall first hold direct negotiations or employ the procedures provided in their collective bargaining agreement.

If not settled in this manner, the parties shall notify the United States Conciliation Service.

If not promptly settled by conciliation, the Secretary of Labor shall certify the dispute to the National War Labor Board, which shall finally determine the dispute.

On behalf of the Army, the Navy, the War Production Board and the Office of Defense Transportation, I call upon every employer, employee, and labor representative in the motor transport industry to comply with the President's Order.

Office of Defense Transportation

Copy of a 19 x 24, two-color poster mailed to fleet operators in behalf of the War and Navy Departments, the WPB and ODT, stressing the need for eliminating strikes for the duration, outlining dispute adjustment procedure, and arging Labor's and Management's compliance with the President's Order



A SECOND FRONT FOR

Soldiers in Overalls

Soldiers in overalls, building weapons for our fighting men, are fighting this war on the production front. But there is an equally important second front of civilian war activity.

On this second front other soldiers in overalls—American service mechanics — must keep buses, trucks and passenger cars on the job, hauling men and materials to their assigned destinations.

Realizing the importance of this automotive service job, Bendix looks upon the production of nceded service parts and materials as an essential part of its over-all war-time assignments.

In addition, Bendix furnishes valuable "Know How" manuals to the soldiers of this civilian second front. Books that help servicemen, new recruits or seasoned veterans, make fewer repair parts do a better job for Victory.

Bendix considers it a responsibility and a privilege to stand by the automotive service trade in its great responsibility to keep American transportation rolling. Products of this Division are vital members of "The Invisible Crew"... precision instruments, and controls, which 25 Bendix plants from coast to coast are speeding to our fighting crews on world battle fronts.

BENDIX PRODUCTS DIVISION

THE INVISIBLE CREW

Precision

Equipment by

CAVIATION CORPORATION



WPB NEWS

More Semi-Trailer Tanks Ordered

Production of 500 additional semi-trailer petroleum tanks by Feb. 15, 1943, to help relieve the oil transportation shortage throughout the country is provided for under Limitation Order L-I-G as amended Jan. 7, 1943, by Ernest Kanzler. Director General for Operations.

A previous amendment to the order. issued Dec. 10, 1942, permitted the manufacture of 300 semi-trailer petroleum tanks, which the Director General for Operations authorized to be produced by Jan. 31, 1943. Those authorized under the present amendment are of the same type and will bring the total up to 800.

According to R. L. Vaniman, Director of WPB's Automotive Division, each semitrailer tank to be manufactured will haul 4000 gallons, or over, and transport more oil per pound of steel and rubber and require less man power than any other type of vehicle available for general use. Due to their adaptability and quick "turn around," it is estimated that one trailer replaces 11 railroad cars on hauls of less than 100 miles. Much of the motive power for hauling the trailer tanks, said Mr. Vaniman, is already available.

Limitation Order L-219

Inventory limitation order (L-219), recently issued by the War Production Board, is designed to see to it that consumer goods are equitably distributed: that the consumer in the rural areas gets his fair share; that the war plant worker in a boom town gets his fair share; that the small retailer stays in business.

Merchants doing more than 50 per cent of their volume of all kinds of goods in the following lines are exempt: Motor Oil and Grease; Motor Vehicles and Motor Vehicle Replacement Parts; Rubber Tires.

Battery Limitation Order Clarified

Inventory restrictions applicable to replacement and rebuilt storage batteries in hands of producers are distinguished from those held by distributors in an explanation of Limitation Order L-180 (as amended Jan. 5, 1943; T-1512), made by the Automotive Division. The distinction is as follows:

Inventory restrictions are eased slightly for 1943 to off-set seasonal sales trends.

A 90 days' supply of replacement batteries is permitted to distributors as against a 60 days' supply allowed in 1942. An inventory of 120 days' supply may be held by producers instead of the 60 days' supply permitted in 1942. A "90 days' supply" is defined as the aggregate number of replacement batteries sold during the corresponding month of 1942, plus the number sold during the following two months in 1942. A "120 days' supply" as it applies to the producer means one-third the number of batteries sold by him during the calendar year 1941.

Some Anti-Freeze Banned: Ruins Cars

The War Production Board has ordered immediate cessation of the manufacture of anti-freeze solutions compounded with inorganic salts or petroleum distillates, because of widespread complaints that these solutions have been found destructive.

Calder Succeeds Kanzler

Donald M. Nelson, chairman of the War Production Board, announced the appointment of Curtis E. Calder, Bronxville, New York, as Director General for Operations. He succeeds Ernest Kanzler, who resigned due to ill health.

Mr. Calder is president of the American and Foreign Power Company, and came to WPB in November as Assistant Deputy Director General for Industry Divisions.

Knowlson Resigns from WPB

Resignation of James S. Knowlson as vice-chairman of the War Production Board was announced recently by Chairman Donald M. Nelson. In making the announcement Mr. Nelson said that he was retaining Mr. Knowlson within the WPB organization on a "when actually employed" basis, so that he could be called on as a consultant or special assistant from time to time.

Mr. Knowlson resigned in order to return to his duties as president and chairman of the board of the Stewart-Warner Corporation in Chicago. This firm has a large volume of war orders, and Mr. Knowlson-who came to Washington 15 months ago expecting to stay three months -felt that he could no longer remain away from its helm.

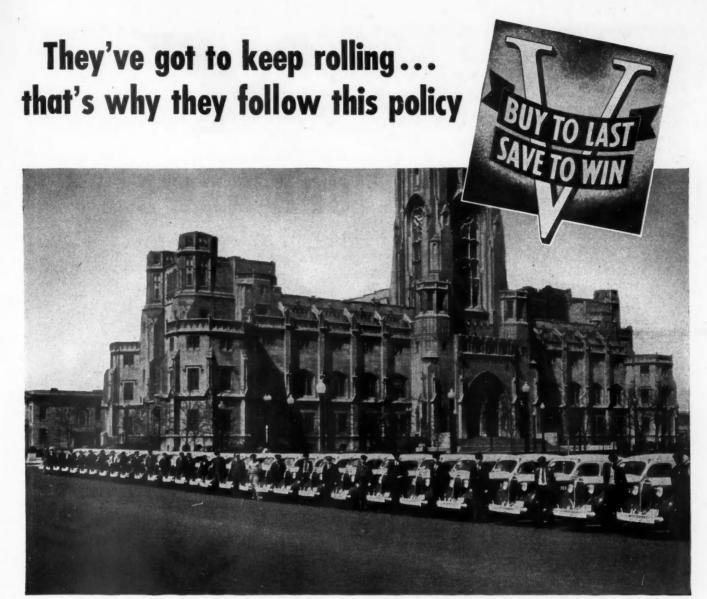
Heavy Truck Manufacture Cut From 4000 to 3580

The number of heavy trucks that may be manufactured for civilian use within the period August 1, 1942, to March 31. 1943, was cut down from 4000 to 3580 under the terms of Supplementary Limitation Order L-1-H, as amended by Ernest Kanzler, Director General for Operations.

The amended order also revises the production schedule of certain specified manufacturers named in the original order. Due to the demand for their facilities in direct war production, some of the manufacturers named are unable to produce the number of heavy trucks originally assigned to them. The following is the revised schedule:

Producer and

G. V. W. groups	Number
(by thousand pounds)	of units
Autocar Co., Ardmore, Pa. 40 to but not including 45 50 to but not including 60	10
50 to but not including 60	25
	45
Dart Truck Co., Kansas City, Mo. 25 to but not including 30	
40 to but not including 30	19
60 to but not including 70	36
100 and over	1
	94
Euclid Road Machinery Co., Cleveland, Ohio	200
Euclid Road Machinery Co., Cleveland, Ohio 50 to but not including 60	50
	250
Four Wheel Drive Auto Co., Clintonville, Wis-	
16 to but not including 20	. 8
25 to but not including 30	65 49
30 to but not including 35	8
Four Wheel Drive Auto Co., Clintonville, Wis. 16 to but not including 20. 28 to but not including 25. 25 to but not including 30. 30 to but not including 35. 35 to but not including 40. 40 to but not including 45.	8
	129
Hendrickson Motor Truck Co., Chicago, III.	****
Hendrickson Motor Truck Co., Chicago, III. 20 to but not including 25	2
25 to but not including 30	1 6
	,
International Harvester Co., Chicago, Ill.	
International Harvester Co., Chicago, Ill. 20 to but not including 25	150 28
to to but not including for	
Kenwarth Motor Truck Corn Seattle Wesh	175
Kenworth Motor Truck Corp., Seattle, Wash. 25 to but not including 30	3
35 to but not including 40	18
50 to but not including 60	17
	60
Mack Manufacturing Corp., Long Island	
City, N. Y. 16 to but not including 20	200
16 to but not including 20	163
30 to but not including 35	216
30 to but not including 35	26 95
60 to but not including 65	1
	791
Peterbilt Motors Co., Oakland, Calif.	
35 to but not including 40	30
	40
Reo Motors, Inc., Lansing, Mich. 16 to but not including 20. 20 to but not including 25. 25 to but not including 30. 30 to but not including 35.	115
20 to but not including 25	04
25 to but not including 80	22 38
30 to but not including 35	
Stanling Motor (Dough Co. Inc. Milinguist W.	239
16 to but not including 20	18. 3 7
Sterling Motor Truck Co., Inc., Mitwaukee, W 16 to but not including 20. 20 to but not including 25. 30 to but not including 35. 35 to but not including 40. 40 to but not including 45. 45 to but not including 50.	10
35 to but not including 40	48
40 to but not including 45	37
45 to but not including 50	2
	110
Walter Motor Truck Co., Ridgewood, N. Y.	
20 to but not including 25	1 4
40 to but not including 45	23
60 to but not including 70	45
	73
The White Motor Co., Cleveland, Ohio 16 to but not including 20. 20 to but not including 35. 25 to but not including 30.	776
20 to but not including 25	591
30 to but not including so	77 60
35 to but not including 40	69
	1,564
	3,580
(TURN TO PAGE 58, PLEASE)	
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Part of the 100 cab fleet operated by United Taxi Company, Indianapolis, Indiana. 100% Exide-equipped, its owners announce fewer delays and better service from Exide than from any other make of battery.





NOWADAYS, taxicab and other transportation companies must use all precautions to keep their equipment in first class shape. The wisest rule is to buy wisely, buy quality equipment, and treat it carefully for longer service. That's a rule you'll find endorsed by the United Taxi Company, of Indianapolis. They've equipped their entire fleet with long-lasting, dependable Exide Batteries. They're getting better service, with fewer delays, than they've ever received from any other make of battery.

Buy to Last and Save to Win is an absolute must for war time transportation. In the battery field you can depend on Exides—their quality construction helps Keep America Rolling.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

WPB NEWS

(CONTINUED FROM PAGE 56)

WPB District Offices Given More Authority

A further step toward decentralization of the War Production Board was taken recently with the granting of increased authority for approval of individual emergency preference ratings to the field offices of WPB.

The 12 regional Directors of WPB are now authorized to approve, countersign, and issue individual preference ratings for emergency repair, up to and including AA-1, in accordance with specific instructions to be issued from time to time by the Deputy Director General for Distribution, Regional Directors may authorize the Deputy Directors to perform these functions.

In addition, the 110 district offices may for the first time grant ratings for emergency repair, up to and including AA-2X.

The authority delegated is limited to cases where the material for which the applicant seeks priority assistance does not exceed \$500 in value.

New Claimant Agencies Represent Transportation

E-tablishment of six new "Claimant Agencies" to present claims for critical materials to the War Production Board was announced. The agencies, which include the Office of Defense Transportation. Office of Rubber Director, and Petroleum Administrator for War, were sent invitations to nominate members to represent them on the Requirements Committee.

Claimant agencies act as spokesmen for the various "customers" using critical materials. They are responsible for making up and presenting their respective programs and compiling requirements of materials to meet them.

Jeffers Controls Rubber Allotments

Authority to allot rubber among all claimant agencies, military and civilian, is conferred on Rubber Director William Jeffers in an amendment to WPB Regulation No. 1 signed by Chairman Donald M. Nelson, the WPB chairman, announced.

This order gives Mr. Jeffers complete centrol over distribution of the nation's rubber supply, including all allocations and apportionments from the rubber stockpile. It also vests in him the power to issue, administer, and if necessary to amend or repeal orders regulating the production, distribution and use of rubber and rubber products; it does not, however, include the authority to control the distribution of materials used in the production of rubber.

WPB Creates Salvage Division

War Production Board Chairman Donald M. Nelson announced the formation of a Salvage Division, headed by Paul C. Cabot as Director.



OPA NEWS

Essential Sales Rate "C" Ration

Formal provisions under which salesmen distributing essential commodities—other than salesmen in 17 Eastern States and the District of Columbia—will be allowed additional mileage, were written into the gasoline rationing regulations by the Office of Price Administration.

As requested by Rubber Director William Jeffers, OPA is providing to qualified salesmen up to 65 per cent of their last year's mileage, or 8600 miles a year, whichever is less. However, because of the gasoline shortage in the East, the extra gasoline for salesmen will be provided only in the states outside the eastern shortage area.

OPA War Price and Rationing Boards issued ration books for the additional mileage beginning Jan. 8.

To qualify, a salesman must have been principally engaged in an eligible sales activity for the last three months, or he must be taking the place of a salesman who was so engaged. He must also meet the OPA requirements on ride-sharing and lack of alternative means of transportation.

Eligible salesmen include:

1. Those primarily engaged in selling necessary materials or necessary equipment for the operation of naval, military or hospital establishments or facilities, common carriers, public utilities, industrial. extractive or agricultural establishments essential to the war effort, or any other of the establishments or facilities listed as essential in the gasoline rationing regulations.

2. Those principally engaged in selling those foods, building materials, clothing. fuels, and medical supplies which are essential to public health, and safety, except those selling direct to consumers for personal family or household use.

The allowed mileage, which in no event can exceed 717 miles a month—based on 15 miles to the gallon—will be issued in the form of a "C" ration.

The eastern gasoline shortage area, which is exempt "until the Office of Price Administration finds that the available gasoline supply in such area justifies extension of the provisions" for salesmen to that area, embraces:

States of Connecticut, Delaware, Florida, Georgia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, and the District of Columbia, and the County of Sullivan in the State of Tennessee.

Recap Shipping Costs Banned

The OPA announced that dealers in retreaded and recapped tires who do not possess their own equipment and must have the work done by other recapping establishments may not pass on to their customers resulting transportation charges.

The amount of such transportation charges is one of the dealer's costs of doing business, OPA said. No extra service is rendered the customer, and therefore the customer is entitled to take delivery of the tires at dealer's place of business without paying more than the ceiling price.

OPA pointed out, however, that if a customer wants his tires delivered to him from the dealer's place of business, the dealer may make a charge for that service at his Jan. 9, 1942, rate provided he made a special and separate charge for the same type of service on Jan. 9, 1942—the base date used in Schedule 66.

Tire Inspection Program Revised

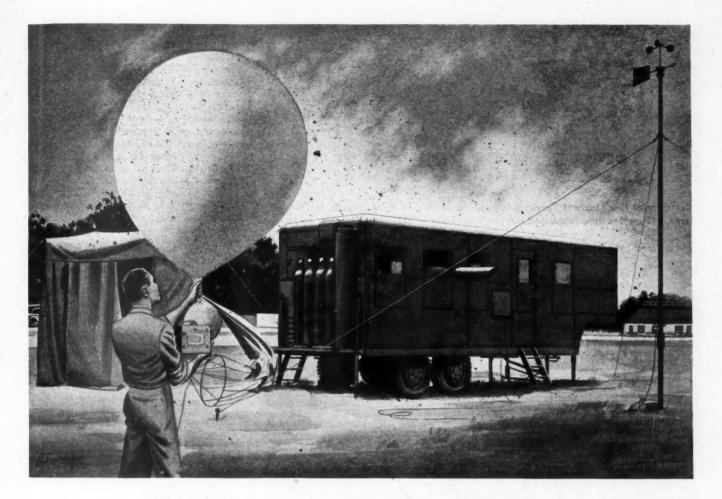
Changes in the periodic tire inspection program to minimize public inconvenience and smooth out occasional work peaks for the qualified inspectors were announced by the Office of Price Administration.

Under the revised plan, all holders of basic "A" mileage rations will have until the end of March for their initial tire examinations. Subsequent inspections for this group will be once in each six-mouth period, against the former requirement of once every four months.

Motorists with "B" or "C" supplementary books or bulk coupons for fleets will be required to get their first inspections by the end of February. After that, inspections for "B" book holders will be once in every four months, and for "C" book holders and bulk coupon holders, once in every three months.

Joy Riding Banned in East

All pleasure driving by holders of A, B, and C passenger car gasoline rations in the 17 Eastern states and the District of Columbia was outlawed as of noon, Jan. 7.



Signal Corps "Weather Men"

work in Lindsay Structure combat bodies

HOW STRONG IS LINDSAY STRUCTURE?



ANSWER: A 36" sheet of 24gauge steel under uniform tension possesses greater tensile strength than a 1" steel rod!

The high strength-weight ratio of a Lindsay Structure assembly conserves steel—reduces weight—makes lighter, faster combat bodies capable of standing tremendous punishment in any kind of weather or climate.

Providing protection for delicate instruments and supplies in theaters of operation the world over, Lindsay Structure combat bodies are used for a wide variety of wartime services—mobile workshops, hospital units, supply vehicles for food and ammunition, as well as this special meteorological laboratory.

Shell holes, rocks, soft sand, destructive heat, humidity, or cold have shown that only all-steel combat bodies insure dependable operation—continuous service. The Lindsay Structure method of assembly—which utilizes all the strength in light sheet metal—is the practical solution. It provides great strength and yet saves steel (over 1000 lbs. in the case of the Canadian Army mobile workshop).

Lindsay Structure combat bodies can be shipped "knocked down" to save priceless cargo space. They are easily assembled by unskilled workmen.

IMMEDIATE SERVICE ON YOUR PILOT JOBS for war equipment. Phone or wire Lindsay Structure Division, 222 North Bank Drive, Chicago, Ill.; or 60 E. 42nd St., New York, N. Y.

LINDSAY
|S STRUCTURE

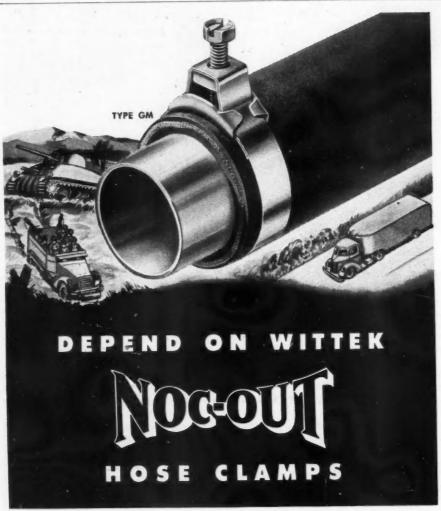
U. S. Patents 2017629, 2263510, 2263511

LINDSAY STRUCTURE CAN SAVE THOUSANDS OF TONS OF STEEL PER MONTH



CCJ NEWSCAST

Commercial Car Journal Truck Specifications will next be published in the April issue. Specifications published in the December, 1942, issue remain unchanged





Type A – Adjustable For Replacement.

The standard of the industry. Quicktightening, perfect leak-proof hose connections, for original equipment and replacement. For Radiator, Heater, Booster Brakes and High Pressure hose connections. Wittek Manufacturing Co., 4305-15 W. 24th Place, Chicago, Ill.



Type HP—For High Pressure Requirements.

WITTEK NOC-OUT HOSE CLAMPS

Certain Anti-Freeze Solutions Banned by WPB as Harmful

Manufacture of anti-freeze solutions compounded with inorganic salts or petroleum distillates was prohibited by an order issued by WPB.

The new order (Limitation Order L-258) was issued as a result of widespread complaints from motorists, truck operators, and motor service establishments that certain anti-freeze solutions have been found highly destructive to radiators, ignition systems and rubber connections.

The solutions prohibited include those compounded with inorganic salts, including calcium chloride, magnesium chloride, or sodium chloride, as well as petroleum distillates.

250,000 Military Trailers for 1943

The production of more than 250,000 trailers, including sizes from the smallest to the largest, is called for in the tentative 1943 program for military pneumatic tire trailers, the Truck Trailer Industry Advisory Committee was informed at a recent meeting held with officials of the War Production Board. The actual number to be built is still under study.

The availability of replacement parts for truck trailers also was discussed and a sub-committee was appointed to confer with the WPB's Automotive Division on this problem.

E. C. Fink, Mack Truck President, Dies at 62

E. C. Fink, president and chairman of the board of Mack Trucks, Inc., died in New York City on Jan. 1 following a heart attack suffered a few days earlier. He was 62 years old.

A pioneer in the truck industry, Mr. Fink had been an officer of the company since its organization in 1911 following a consolidation of the Mack Bros. Motor Car Co., the Hewitt Motor Co. and the Sauer Motor Truck Co. He was for many years vice-president in charge of production at the company's plants in Allentown, Pa., Plainfield, N. J., and New Brunswick, N. J. In this capacity he supervised the development of Mack truck, bus and fire apparatus models over a period of years that saw far reaching changes in the design and construction of motor vehiclesand in the extension of their use. He was elected president and chairman of the board in January, 1937, succeeding the late-Charles Hayden.

Born in Cincinnati Mr. Fink started his career with the old machine tool firm of Lodge & Shipley, thus acquiring the practical first-hand knowledge of machinery that was to guide him so successfully as an executive. He later served with the Prentiss Tool and Supply Co. and the Stevens Arms interests.

As head of Mack Trucks during the present war he was the guiding hand in the design of the specialized motor trucks Mack is supplying the armed forces and in the development of the huge Mack-built

(TURN TO PAGE 151, PLEASE)



MIDLAND JOINS AND THE MARINES

Midland Units selected

by Higgins Industries
for landing barges
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Everywhere

the army the navy the marines are located you will

find MIDLAND Power Units doing



Allied forces all over the world today are relying on

IDLAND DEPENDABILITY. I On the home front



MIDLAND Units are still serving the



"Those who know power control units choose Midland"



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MIDIA (Aprile 1891)

POWER CONTROL UNITS



THE MIDLAND STEEL PRODUCTS COMPANY . CLEVELAND, OHIO

CCJ NEWSCAST

(CONTINUED FROM PAGE 60)

Lubrication School for Women

A national program for the training of women as lubrication experts is proposed by Chevrolet, according to William E. Holler, general sales manager.

Already, one class has been held under Chevrolet auspices. In a four-day session. conducted by the Oakland (Cal.) Zone service personnel, 23 girls of the 84 applicants for the service training were taught a full course in lubrication. Technical terms were simplified, basic procedures carefully mapped, and tools and equipment fully explained. Without exception, they have been endorsed by the dealers employing them as capable operators fully qualified to take over this highly specialized operation.

Tyson Gets Joint "E"

Tyson Bearing Corp. has been awarded the Army-Navy "E". The corporation manufactures tapered roller bearings for Army and Navy guns and essential automotive, farm equipment and industrial uses, as well as precision parts for warplane engines.

Anthony Gets "E" on Anniversary

Presentation of the Army-Navy "E" to the Anthony Company, Inc., Streator, Ill., manufacturer of hydraulic hoists and bodies, on January 22, marks another distinct achievement for a pioneer in this industry. Knowledge that they are the first in the hydraulic hoist and body industry to receive this coveted award, adds to the pride of employees and management in the 25th Anniversary which they are currently celebrating.

Hercules Awarded Army-Navy "E"

The Hercules Motors Corporation, Canton, Ohio, was informed by Under-Secretary of War Robert P. Patterson that the Army-Navy "E" award has been granted to the men and women of the corporation for production excellence. Presentation was made by Colonel Harold M. Reedall.

Wolf's Head Adopts Glass Package

Wolf's Head 100% Pure Pennsylvania Motor Oil has adopted a new war-time package-a distinctive one quart glass jar. refinery-sealed to insure delivery in its original condition. The convenient, attractive new package has a metal screw top and the familiar "safety-seal" closure to protect its contents.

Autocar Promotes E. F. Coogan

Edward F. Coogan, since 1936 sales manager of The Autocar Company, motor truck manufacturers of Ardmore, Pa., has been appointed a vice president. In addition to his past duties, he will become more directly concerned with the company's expanding service requirements for military vehicles.

J. Cremins en appointed nal manager burgh area. He succeeds G. E. Read, who recently became Philadelphia regional



A. Skillman been appointed man-ager of the New York baker. He succeeds R. F. Gloster, assistsales manager, who was commissloned a major in the Army. Mr. Skillman has been with Stude-baker for more than 14 ye a r s. He was manager of the Buffalo region, which now has been added to the New York branch.



(TURN TO PAGE 64, PLEASE)

for VICTORY over Merchandise Losses Use HANSEN with LOCKING CYLINDE

No. 60-L LOCK (ri with Lock and two 60-L EXTENSION
K (right - hand),
Locking Cylinder
two keys. Made in piece





HERE'S a Hansen Lock—plus! Hansen dependability plus the added safety of a Locking Cylinder, which is pick-proof,

tamper-proof—against loss or theft of merchandise in transit, stored or left in truck. Equip your truck or fleet bodies with Hansen Locks with Locking Cylinders—for complete protection to deliveries.

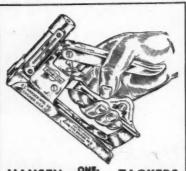
Locking devices have been added to many of the standard Hansen Locks, including Locking Cylinders, Locking Handles and special types of Locking Mechanism. It costs little extra to lock-equip your Locks and it's much safer!

Hansen Locks are noted for their rugged strength, simplicity and serviceability. The Hanson Line includes
Refrigerator, Slam ming,
Slam-and-Take-up, Cab, Extension and Sliding Door
Locks — also, Regulators, Hinges, Handles, etc. all built for service!

On your next order for bodies—one or a fleet—be sure to specify HANSEN the Hardware for Hard Wear!

124 SLAM-and-TAKE-UP LOCK with Lock-Cylinder and two keys. Can be supplied either Flush or "T" Handle.

SEND FOR CATALOG—if you don't aiready have one. It shows the complete line of Hansen Hardware and One-Hand Tackers.



HANSEN ONE-TACKERS Used in automotive and airplane industries for various tacking and fastening jobs—insulatios, seat covers, airplane construction, etc. For driving Tackpoints up to ½" length. Powerful. Portable. One-hand operation.

Write for Descriptive Folder





TIME DOES TELL...PLENTY!

The Mack trucks you see on the road today are of all capacities. But there's one thing they have in common Being Macks, they're built to last! That's a basic Mack advantage, doubly important in wartime when replacements are hard to get. Seven of every ten Macks built ten years ago are still on the job. For forty-three years Mack trucks have established a record for long life that is still gaining on home front and battle front alike. The expression "Built like a Mack truck" was not coined by us, but by those who watch Mack trucks at work.

Mack Trucks, Inc., Long Island City, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J. Factory branches and dealers in all principal cities for service and parts.



U'VE GOT A MACK, YOU'RE LUCKY...IF YOU PLAN TO GET ONE, YOU'RE WISE!

CCJ NEWSCAST

(CONTINUED FROM PAGE 62)

shown remarkable growth in recent years, but the increase in ton-miles in 1942 was only 7 per cent over the total for 1941. The industry is faced with a number of difficulties during the coming months, chiefly lack of manpower. To relieve this shortage it is estimated that an additional 180,000 women must be trained

Transport Index Shows Record Gain

That the transportation agencies of the United States are doing a remarkable job in the war emergency is shown by the fact that the total volume of transportation, including commodity and passenger traffic, increased by 28 per cent in 1942 over 1941, a record year-to-year gain, according to the new monthly index of the Department of Commerce.

Intercity motor truck performance has

plished without the operator leaving the

machine. Actually, it's a complete relin-

ing-refacing department. Every known

labor saving feature is incorporated in

it's design. Write for catalog of the

complete "Chicago" line.

* SET BACK DELINER... Full vision clearance. Motionless, adjustable knockout punch. Built-in old rivet collector.

1942 TRUCK TONNAGE NEAR 1940 TOTAL

Volume of truck hauling on main rural highways in 1942 was substantially the same as in 1940, despite restrictions imposed last year on truck operation to conserve vehicles, tires and gasoline, Public Roads Administration of the Federal Works Agency announced today.

During 1942, trucks hauled an estimated

46 billion ton-miles of freight on main rural roads, compared with 46.7 billion in the more normal year 1940.

A large, but undetermined, amount of the 1942 volume was traffic of war industries and it was the urgent war need for highway transport which prevented any substantial reduction in total truck hauling last year despite motor vehicle restrictions.

Heavier loads were possible because of increased use of "combination" outfits. Equipped with 3 to 7 axles, dual wheels, and 10 to 26 tires to keep loads within legal limits, these tractor-truck, semitrailer, and trailer combinations haul pay loads up to 25 tons or more and weigh up to 42 tons loaded. Traffic of truck combinations has been increasing since 1936.

Combination outfits carried about 29.2 billion ton-miles in 1942, compared with 23.5 in 1940. Their 1942 tonnage movement was about 74 per cent greater than that of single-unit trucks, whereas in 1940 they carried about the same ton-miles as single units.

Combination outfits are especially numerous in the West. This in part explains why ton-miles of load carried by trucks in the Pacific region was about 22 per cent greater in 1942 than in 1940, but in the country as a whole was slightly less in 1942 than in 1940.

One feature of truck traffic observed last year was the heavier loads of loaded trucks. Another characteristic was the larger percentage of both single units and combinations running empty, compared with 1940. Trucks carrying workmen to war plants were observed, and since they did not carry commodities, were recorded as empty. Many single-unit trucks in 1942 may have been used in place of passenger cars. But the empty runs of combinations were probably principally to inability to obtain return loads from construction jobs, military establishments, etc.

Axle loads in excess of 18,000 pounds, which tend to damage road surfaces and are illegal in 35 States, were nearly three times as numerous in 1942 as in the period 1936-40.

William Orwin Banta, 58
years old, sales manager,
replacement service division, Sealed P c w e r
Corp., died suddenly on
Dec. 31, 1942, at his
home. He joined Sealed
Power in July, 1935, as
district manager in California, becoming sales
manager of the service
division in 1937



(TURN TO PAGE 66, PLEASE)



DEEP THROAT . . . For easy working.

ADJUSTABLE ANVIL . . . Quickly set for any length rivet.

DRILLING UNIT . . . Two-speed, V-belt drive, no hand pressure required, foot operated.

QUIET . . . No noisy clatter.

AND MACHINE CO.

| Chicago Suburb | Chi

★ LOW HEAD . . . Specially designed to facilitate work even on small diameter bands. ★ SMOE STRAIGHTENERS... Built in.

TESTED AND APPROVED FOR

U. S. ARMY AND NAVY USE

QUICK DELIVERY!

FINER FEATURES

* GRINDING UNIT... Fully machined, large table, 61/4" cushioned abrasive drum. * CAPACITY... Up to 1/4" diameter tubular or solid rivets.

Here's Where the Trouble Starts!



35 m.p.h. Speed Means More Oil Pumpers!

Speed limitations are doubly hard on engine bearings. If they are worn to the point where they are causing oil pumping, it will be doubly bad under the 35 m.p.h. limit, because the engine never reaches efficient driving temperatures. Add to that the fact that all of these conditions are conducive to crankcase condensation, which creates corrosive acids affecting certain types of bearing linings.

Those are good enough reasons why, at the sign of smoky exhaust, or a sluggish motor, it is good practice to check the engine bearings—to prevent more serious engine injury later. If they are worn, replace in sets with Federal-Mogul Oil-Control Bearings to restore power, pep and economy, for most efficient and most economical operation under today's driving conditions!

FEDERAL-MOGUL CORPORATION . DETROIT, MICHIGAN

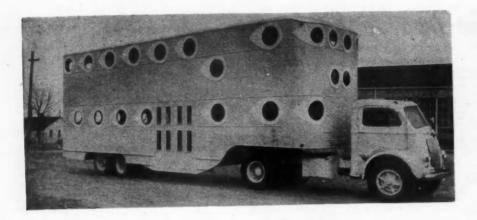


FOR VICTORY

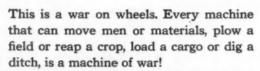
Submarines, aircraft carriers, minesweepers, rescue tugs, dredges are equipped with Federal-Mogul bearings and other precision parts. With added production capacity, Federal-Mogul works "all out", manufacturing bearings and precision parts for planes, tanks, guns, boats—and milions of bearings to service the automobiles carrying war workers and materials to their jobs. We "Keep 'em rolling"!

WORN ENGINE BEARINGS CAUSE OIL PUMPING





Wasting Motive
Power is "Mechanical
Treason"!



And the power to drive them is precious beyond price! To waste a single horsepower of it needlessly is small-scale sabotage!

Inefficient spark plugs are one form of such "mechanical treason." You owe it to your Uncle Sam to use good plugs that fire hot and efficiently and convertall the valuable fuel burned into power!

Today Edison makes the finest spark plugs ever to bear this famous name. Their precision-engineered construction attains a new high in the delivery of peak power.

Of course, war needs come first. So if Edisons are not available when plug replacements are needed forgive us—but use good plugs!



EDISON-SPLITDORF CORP., WEST ORANGE, N. J.

Left: Largest bus in the world. One of two built by Timpte Bros., Denver, Colo. In service at Camp Carson for troop transportation, this bus is 35 ft. long, 10 ft. wide, 15½ ft. high; carries 260 men—106 sitting, 154 standing. Chassis built from used materials and scrap, body is wood. Unique feature: Head room on first dock is low over seats, full height in center aisle for standees; top arrangement reversed with seats in center and standees in wells over seats below

CCJ NEWSCAST

(CONTINUED FROM PAGE 64)

Inter-State Buys I. R. Truck Line

Application of the Inter-State Motor Freight System to purchase the motor freight division of Indiana Railroad has been approved by the Interstate Commerce Commission and the Public Service Commission of Indiana and the transaction has been consummated, W. F. Drohan, vice-president and general manager of Inter-State System, announced.

Dayton Releases War Tires

Dayton Tire dealers and distributors are now receiving their allotments of the new Dayton Wartime Tires. A factual booklet also is being distributed by Dayton Dealers—"How You Stand on Tire Rationing." and is offered in the interest of rubber conservation for America's military and essential civilian needs.

Chicago Tariff Indictments Postponed

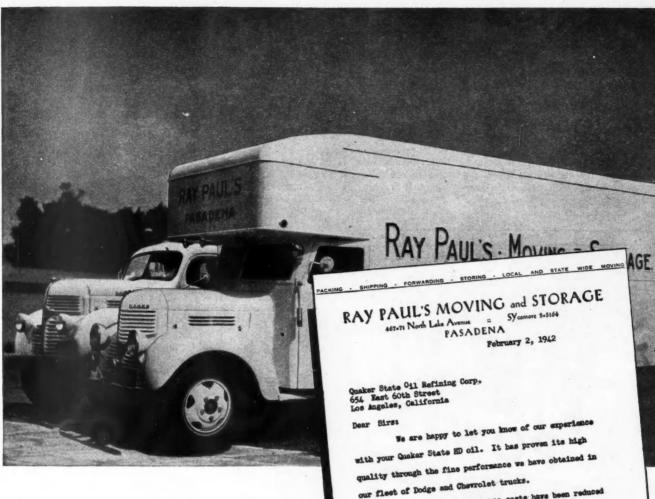
Attorney General Francis Biddle announced that he was acceding to the request of the Secretaries of War and Navy, and the Director of the Office of Defense Transportation, that indictments prepared pursuant to evidence presented to a grand jury in Chicago, involving abusive and coercive practices in the private fixing of rates by motor and rail carriers, be postponed.

War Department Consolidates Transportation Field Agencies

The War Department announced that the field agencies of the Transportation Corps. Services of Supply, have been consolidated into Transportation Zones, corresponding to the nine Service Commands, each subdivided into transportation districts. Zone and District Transportation Officers will exercise general supervision over all transportation matters which are not part of the responsibility of Defense Commands, Service Commands, or Commanders of other installations.

S. F. Baker Completes Army Course

S. F. Baker has returned to his duties as vice-president of the Thornton Tandem Company of Detroit, having completed the Civilian Orientation Course presented by the Command and General Staff School of the United States Army at Fort Leavenworth, Kan. Mr. Baker, a World War I flyer, was one of a group of 87 men selected by Lieut. General Brehon Somervell to participate in this condensed General Staff officer's course. This group was chosen as a cross-section of all types of business and professions interested in war activities.



This letter's every line and phrase Tells why the use of the use of this oil, as it is keeping the rings and

Quaker State HD pays!





QUAKER STATE

by ROBERT F. BAHL

(Correct Answers on Page 118)

We will have to wait until we beat Herr Schickelgruber before there are any new developments in motor transportation, but we can expect quick and fast advancement just as soon as the war is over. Meanwhile, test your knowledge with a few Quiz Questions about past developments in the motor field. With each question worth 10 points, see how near you can come to scoring 100. Correct answers are on page 118.

Today's sealed beam headlights are a far cry from the earliest lamps on trucks, which were illuminated with . .

a. Acetylene. c. Carbon filament lamps. b. Carbon arcs. d. Coal gas.

Speaking of the sealed beam headlight. this innovation is recent enough for all of us to remember the year of its introduction. It first appeared on . .

a. 1932 models.

c. 1940 models.

b. 1936 models.

d. 1942 models.

3.

One of the greatest contributors to the development of motor transportation mysteriously disappeared at the height of his career. He was

a. Dr. Rudolph Diesel.

b. Gottlieb Daimler.

c. Charles E. Duryea.

d. W. C. Durant.

To see what goes on inside an engine. research men hit upon the idea of installing a window in the combustion chamber. The material used to make this window is . . .

a. Transparent plastic.

b. Quartz.

c. Diamond.

d. Shatterproof window glass.

Paul de Kruif, the famous author, traces the development of the automobile industry not back to Ford nor Duryea nor Haynes nor Olds, but to the Merritt brothers, who discovered . .

a. the first oil deposits in the U.S.

b. the Mesabi iron range.

c. the rubber tree.

d. the explosive properties of gasoline.

Which of these would you connect with the invention of the electric self-starter?

a. a broken arm. c. a broken jaw.

b. a broken back. d. a fractured skull.

7.

Oil is where you find it, and when Colonel Drake drilled his first well at Titusville, Pa., he found it at a depth of . . .

a. 15 feet.

c. 423 feet.

b. 69 feet.

d. 1861 feet.

What would be the purpose of swinging a car on a huge pendulum in a testing laboratory?

a. to see that all nuts and bolts were

b. to distribute oil and grease evenly.

c. to make sure that the engine will be able to stand jolts.

d. to determine the center of gravity.

9.

The manufacture of anti-knock gasoline required tremendous amounts of bromine. This important element was not available until a way was found to extract the necessary quantities from .

c. coal. a. ordinary table salt.

b. the ocean.

d. limestone.

10.

This last question is divided into five (5) separate points. Your assignment is to number the five events below in the order in which they made their appearance on automotive vehicles . . . first, second, and up to the fifth. Score two points for each event that you place in the correct notch.

a. Introduction of the electric generator.

b. Vacuum fuel tanks first appeared.

c. Safety glass introduced.

d. Oil filters introduced. e. Balloon tires introduced.

Loaded with power for quick, positive starting in all temperatures, NIEHOFF COILS give unrivalled electrical performance with minimum battery drain. Ample reserve capacity assures smoother acceleration and better gas mileage.

Complete stocks of approved quality coils, to service all trucks and buses on the road are strategically located in a National network of NIEHOFF Jobbers.

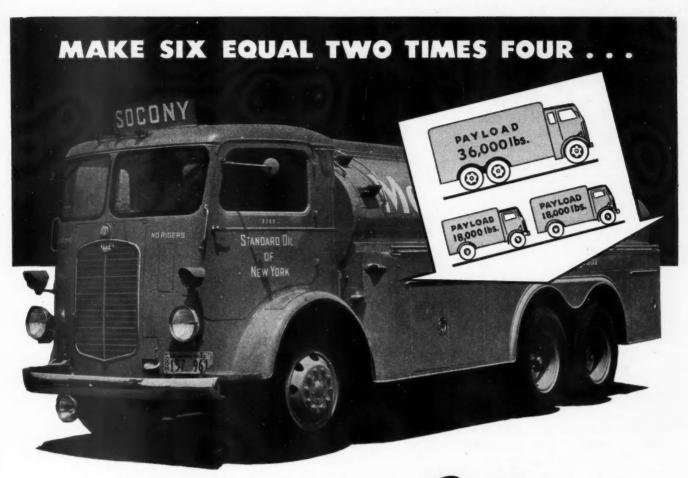
Every necessary replacement with a Niehoff Coil will help to maintain our vital and efficient automotive transportation system so essential to the needs of our country.

Ask your Jobber's salesman NOW.

C. E. NIEHOFF & CO.

Chicago, Illinois 4925 Lawrence Ave.





WITH A Trucktor 3rd Axle!

"SIX equals two times four" wouldn't win a gold star in the classroom but it makes sense in truck transportation. Because a Trucktored six-wheeler conversion will carry two times as much payload as a four-wheel truck.

Furthermore, you effect several important savings in vital materials and manpower by this conversion . . . savings that will favorably impress your Rationing Board when you apply for a Trucktor Third Axle.

In addition, the six-wheeler is easier on the highway, (proved by government impact tests), and therefore easier on your tires. It is safer, (verified by I.C.C. accident reports and insurance company statistics). It is more maneuverable, (witness its wide use by the Army). If you need extra hauling capacity, (and what fleet-owner doesn't), the Trucktored six-wheeler is your best solution to stringent truck rationing. Write us for detailed information.

... AND SAVE VITAL MATERIALS and MANPOWER

Conversion of a four-wheel truck into a six-wheeler with a Truck-tor Third Axle saves one comlete truck, one driver, two rubber tires and tubes and much gas and oil.

THE TRUCKTOR CORPORATION • 156 WILSON AVENUE, NEWARK, N. J.



TIME THE ENGINE TO YOUR FUEL

(CONTINUED FROM PAGE 33)

Subsequent to the foregoing tests, conducted under controlled road test conditions, tests were conducted, using heavy duty transport trucks in regular service, to determine the influence of changes in octane number on over-all performance as noted by the drivers. Five tractor-trailer transport units were each operated from 1200 to 2500 miles on two currently available commercial gasolines.

In connection with these service tests, each driver was required to submit a daily report on the performance of his vhicle, and it is rather interesting to note that none of the drivers detected a difference in performance between 65 and 72 octane number gasolines, although results of tests under controlled conditions indicated that about 5 per cent loss in power could be expected.

Although results of these tests indicated satisfactory performance from a fuel of relatively low anti-knock quality, the following two points should be considered before concluding that such a fuel would be fully satisfactory in service:

1. The optimum spark timing for obtaining maximum performance from a given fuel will vary, even among engines of the same model, depending on engine adjustments and deposits. Therefore, to use a fuel with a slight deficiency in anti-knock quality would probably necessitate determination of the allowable timing for each individual engine in a fleet, or at least a close check on the estimated spark adjustment.

2. Use of a fuel having anti-knock quality in excess of that required for obtaining maximum performance allows a factor of safety for maladjustments and abnormally severe operating conditions. In one case a relatively low octane fuel might show entirely satisfactory results, while in another the same fuel might give unsatisfactory results even in the same type of equipment.

From the foregoing, it is evident that although satisfactory performance can be obtained from a 65 octane fuel, the use of such a fuel would probably require somewhat closer maintenance than would be necessary if a higher octane fuel were used.

A most interesting observation was that a number of the drivers "lugged" the engines rather than shift to a lower gear maintaining a reasonable engine speed. The ease with which the gears could be shifted seemed to influence the drivers' reaction to proper shifting. It was noted that the drivers invariably "lugged" the engines in trucks which were difficult to shift. Since this low engine speed condition, with full throttle, represents the condition at which the highest octane requirement is obtained, it appears that this condition (15 to 25 m.p.h. in high gear) will determine the octane requirement of the engine in service. Further, the low speed anti-knock prformance of fuels should be considered as well as the high speed performance because of such operating conditions in ser-

CONCLUSIONS

1. The five commercial engines tested, under controlled conditions, had an average requirement of 73 octane number for trace knock at maximum power spark timing.

2. Retarding spark timing was indicated as the most satisfactory method to compensate for reduction in octane number. Results of road tests, under controlled conditions, showed average allowable timing of 11/2 degrees advance (from standard), 41/2 degrees retard, and 9 degrees retard for trace knock operation on three representative commercial gasolines of 77.0, 70.5, and 66.0 ASTM octane number respectively. The test data indicate that when using optimum spark settings for each fuel, a loss of about 4 per cent in full throttle acceleration and 1 per cent in fuel economy would result from using the 70.5 octane number in comparison with the 77.0 octane fuel.

3. From the results of these tests it does not appear feasible to lower engine octane requirements by enriching carburetion. Such compensating adjustments appear to give much greater relative loss in power and economy, for a given octane reduction, than is obtained from retarded spark timing.

4. Performance of the commercial engines tested appeared to differ from previously noted passenger car engine performance in that:

a. Light to medium detonation can normally be tolerated in passenger car service, whereas in commercial operation a light knock will increase to pre-ignition conditions under prolonged full throttle operation.

b. In the engines tested no appreciable improvement in power or economy resulted from advancing spark timing from the basic timing specified by the manufacturer, but in passenger car engines the basic timing is often retarded 5 to 10 degrees from the maximum power setting because of detonation requirements. This indicates that the use of fuels, having octane ratings above the octane requirement (at basic setting) of the engine, may give no improvement in performance in commercial engines.

5. The recent drop in regular grade gasolines, from 75.0-76.0 to 71.0-72.0 ASTM octane number is indicated from these tests to have no important effect on fuel economy or power output in heavy duty service when spark timing is properly retarded for the lower octane number fuel.

6. No major engine changes, such as changes in compression ratios, are necessary unless fuels of lower than 65 octane number are used.

7. Service tests in five transport trucks in intra-city and inter-city operation indicated no significant differences in fuel consumption or power output, when using 65 octane and 72 octane commercial gasolines.

END

(Please resume your reading on P. 34)



Highlight of impressive ceremonies held in the plant of the Spicer Manufacturing Corporation. Toledo, Ohio, as it was awarded the Army-Navy Production "E" Award. Spicer units are being used in practically all types of mobile eguipment used by the armed forces



To save fuel, tires and manpower, Easton Car and Construction Co., Easton, Pa., designed and constructed this double-bodied semi-trailer for hauling rock from shovel to crusher in 17-ton loads. The double body idea was engineered to accommodate the size of the crusher hopper



FROM cartridge cases to cargo planes, the use of wood as a weapon of war is growing tremendously in importance. Wood—millions upon millions of feet of it—is now going into the construction of war worker homes, army barracks, war plants, transport ships, troop landing barges, fast torpedo boats, sub-chasers, patrol boats. Boxes, crates and containers—thousands of them—for Army and Navy Ordnance materiel alone will take an estimated billion and a half feet of lumber. Wood is vital to Victory—now serves as a worthy substitute for steel and other strategic metal shortages.

So axes are ringing and saws are singing with growing urgency in the timber stands of the Northwest and in the Southland—wherever logs can be "toted"—to serve our War needs. And to make sure that it won't be "too little and too late," big, husky, four and six-wheel Federal Trucks are in there fighting—under the most gruelling kind of punishment trucks were ever built to take—carrying huge loads of massive logs over forest floors, often without benefit of graded roads or even trails.

Federal balanced truck design is maintaining a reputation for husky dependability and hardboiled performance among lumbermen who pride themselves on never making an excuse—or taking one! Again we repeat: "Toss the Tough Jobs to Federal!"

FEDERAL MOTOR TRUCK COMPANY, DETROIT, MICHIGAN

UNCLE SAM
NEEDS EVERY
TRUCK OWNER'S
PLEDGE TO

"Keep 'em Rolling!"

U.S. TRUCK
CONSERVATION CORPS

America's trucks—YOUR TRUCKS—mustkeep working for Victoryl Frequent and thorough check-ups and mainte-

nance will help keep trucks on the job—reduce operating costs. Go to any Federal dealer and sign Uncle Sam's pledge to Keep 'em Rolling. Make it All Out for Victory —Not Time Out for Repairs!

FEDERAL TRUCKS

Since 1910 . . . Known in Every Country-Sold on Every Continent

TVA CONSERVATION CUTS COSTS

(CONTINUE FROM PAGE 35)

is producing much more power than before the war.

Better equipment, a preventive maintenance program that really works because it is pursued on a scientific basis, and an educational program for both our maintenance men and the men and women of the Authority who use our trucks and cars explain the yearly decrease in costs.

We expect, however, that the costs will go up from now on because of the extra cost of rehabilitating old equipment that cannot now be replaced. In addition, we expect the maintenance costs of older equipment to mount.

The Transportation Division numbers 261 employes, including 239 garage employes and 22 office employes. In addition, we have two plane mechanics and two pilot-mechanics. There are employes on duty continuously at the base garages, and two eight-hour shifts are maintained at most of the field garages.

We operate three fully equipped repair shops, or base garages, where almost any type of repair or rehabilitation work is done. These are located at Knoxville and Chattanooga, Tenn., and Wilson Dam, Ala. In addition, we have 15 field garages. These are semi-permanent garages located at the various power projects to take care of equipment on the job. These field garages take care of current maintenance and repairs, while the base garages do the rehabilitation, overhauls and all major work.

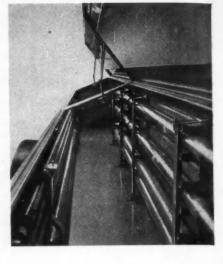
Several mobile service units take care of vehicles on projects which do not have field garages. These units usually operate in isolated places and provide emergency repairs so that the vehicles may be sent back to base or field garages for complete repair.

A number of contract garages, which display a TVA sign, are available for other emergency work, emergency tire repairs, gas and oil. And the better equipped contract shops are authorized to perform our PM service.

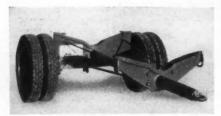
During the present emergency period, we use our newer vehicles on distant jobs where Authority engi-

TVA designs and makes much of own equipment Below: Special trailer for tools and equipment is fitted with heaters to dry thoroughly al tools, mats, gloves and other live line han dling equipment. Right: Interior of unit below









Two different pole dinkeys partially designed and entirely constructed by the Authority. Only the axies, wheels, pole drawbars and pole binders were purchased. The rest is salvaged scrap





This truck and trailer, used as an outfit, averages 20,000 miles a year moving heavy transformers and machinery. Since photograph was made, trailer has had a number of important improvements

neers are working on Government mapping projects. In that way we avoid major breakdowns. When they occur, major breakdowns are usually due to major accidents rather than failure of PM.

Several paragraphs back we mentioned that our preventive maintenance program was conducted on a scientific basis. A good example is our engine lubrication practice. During our first several years of operation our vehicles traveled over 36,000,000 miles without any oil changes.

This practice is not the result of an arbitrary decision, it is based on \$500 spent on lubricating oil experiments in TVA's laboratory. As a result of our findings, we saved \$1,500 in oil alone during the first year. However, having adopted the nonchange policy, we didn't just proceed without continued study and observation. Our constant tests of oil taken from crankcases have shown us that closer clearances, higher compressions, higher output and higher temperatures of the newer motors require a different engine lubrication practice than the cars of our first few years. These tests also show the proper interval for changing oil on the different vehicles.

For the past three or four years our standardized oil change policy has been as follows:

For passenger cars and light trucks: put in new oil immediately upon receiving new vehicles. Then change oil at 1000 miles, 2000 miles, 5000 miles, 10,000 miles, 15,000 miles and then no more unless the vehicle is under exceptionally hard service.

(TURN TO PAGE 74, PLEASE)



MEN OF TYSON PROUDLY WEAR

The Army-Navy "E"

WE AT TYSON are proud to wear the Army-Navy "E" and fly the burgee—award of excellence in production of war materials.

Long before Pearl Harbor, Tyson was turning out "tools of war." Since then, we've doubled and redoubled plant facilities and production.

In addition to heavy-duty roller bearings for Army and Navy gun mounts



and for vital transportation and industrial uses, Tyson craftsmanship produces precision parts for aircraft. Intricate engine suspension units and bearing liners are speeding production of more than half of America's fighting planes.

To the men in the armed forces, Tyson pledges . . . "enough—and soon enough."



TYSON BEARING CORPORATION * MASSILLON, OHIO

FEBRUARY, 1943

Use postage-paid card inserted in this issue for free information on advertised products

73

TVA CONSERVATION CUTS COSTS

(CONTINUED FROM PAGE 35)

For heavy trucks and other heavyduty motors: change oil every 5000 miles or 300 hours.

These practices are made possible by our experiments, use of oils that meet Navy specifications, and use of oil filters on all motors. We buy our oil on bids and make spot checks in our lab to see that the oil is up to the specifications. For the first 1000 miles we use SAE 10 oil on all vehicles, then we go to SAE 20. If we find that oil consumption can be decreased by using SAE 30 on lighter vehicles or SAE 40 on heavier vehicles we do so, but we never use a heavier oil. It's time for an engine overhaul when it needs oil heavier than 30 or 40. These same SAE viscosities are used both summer and winter.

We use depth type filters and prefer baked filtering clay and cellulose cartridges of the untreated type. The type of filter is determined by tests; by the sturdiness of the case and whether it meets our standards. We use by-pass mounting exclusively and have changed several motors and filters from the forced feed type. We find the by-pass, depth type filter gives better and safer filtering action.

Our tests show nothing to be gained by treating filter units to counteract acidity, varnish, etc. The same size cartridges are used on all our vehicles because standardization saves money and trouble without impairing the filtering effects.

Filters are changed every 5000 miles or 300 hours. Garages have some discretion here, because some vehicles may be operated over especially dusty conditions.

Our laboratory tests show that most oil additives are useless, and show that clay type filters remove these additives. We find the principle of oil heat interchangers is good, the devices in use now giving various results.

With these oil practices we are able to run our motors as close to top temperature as possible, usually about 175 degrees F. and thus gain gas economy. We buy and install special high temperature thermostats for all vehicles not so equipped and shield radiators in cold weather.

Engine temperatures are checked every 5000 miles as part of the 5000 mile service, and the mechanic enters the temperatures on the report to show that he has corrected any faulty conditions.

We use Navy contract oil of the required specifications in transmissions and hypoid oil of the mild sulfur type in all rear axles and winch worm gear cases, regardless of whether they are hypoid or extreme pressure type cases. The gear oil is changed twice a year, SAE 90 in the winter and SAE 140 in the summer. By using hypoid oil exclusively, we further standardize without any loss in efficiency and we find it works better than other types in differentials and winch worm gear cases.

no

Our chassis lubricant is a viscous oil, sodium soap product bought on specifications determined in our own laboratory. We find it stays put longer than any other kind.

Because we use Government contract gasolines, we have had very little fuel trouble. We are making a

(TURN TO PAGE 76, PLEASE)



City.



Trucks are in this War, too

• Every truck is a vital war machine. It must not fail in its duty.

Now, more than ever, the piston rings must be watched—and changed at the first sign of failure.

The right rings, installed at the right time, will prevent undue cylinder wear, save oil, save gasoline, prevent lay-up.

Hastings Steel-Vent piston rings have won great favor among fleet operators because of their reputation for long life and economy, in all kinds of cylinders—rebored, resleeved or extremely tapered.

Install Steel-Vents—and keep 'em rolling.

HASTINGS MANUFACTURING COMPANY, HASTINGS, MICHIGAN
Hastings Mfg. of Canada, Ltd., Toronto

PISTON RINGS • PISTON EXPANDERS • VALV-RINGS

HASTINGS

STEEL-VENT PISTON RINGS

Tough on oil-pumping. Gentle on cylinder walls

TVA CONSERVATION **CUTS COSTS**

(CONTINUED FROM PAGE 74)

study of carburetor jets and seats at present to determine a policy on jet and seat life.

Our experiments led us to change our Chevrolets from mechanical control of the high-speed jet to vacuum control because of unbalance in the mixture due to use of governors. This has resulted in better gasoline mileage for this type of vehicle.

Our engines are timed to the fuel and we are finding now that we are forced to retard the firing rate because of the lower octane. All our vehicles have manual chokes. We had a few automatic chokes but found no particular benefit in them and in many cases they were unsatisfactory.

All TVA vehicles are equipped with governors. They are set at 50 m.p.h. but orders are 35 m.p.h. and no higher. We need the extra power for the hills in this section. The governors are of the vacuum-velocity type except on heavy duty vehicles where we use road-speed control with a buzzer in the cab that warns the driver when he approaches within two miles per hour of the limit at which the ignition will be cut off. Drivers are trained to obey our rules.

Our gas economy begins with our gas pumps which are equipped with special nozzles to prevent waste of gas through overflow. When the gas rises in the nozzle it automatically shuts off the flow. No special gas tanks are used on our vehicles although we do use coil springs inside the filler pipe to prevent syphoning of gas from vehicles stored outside and chains on the gas tank caps to prevent loss.

Like every other operator, we have to keep after gas and oil economy through our mechanics and drivers. When gas or oil consumption increases we make a thorough investigation to find and correct the defects.

On various types of vehicles our mileages are as follows, for the period beginning in July through September:

Half-ton trucks-15.75 miles per gallon of gas; 277 miles per quart of

Passenger cars-17.09 miles per gallon of gas; 331 miles per quart of

Light cargo trucks—9.4 miles per gallon of gas; 247 miles per quart of

Heavy cargo trucks-7.9 miles per gallon of gas; 307 miles per quart of oil.

Our tire program is in the process of being developed and so far we are stressing conservation of existing rubber, and constant checking of pressures, wear and tire condition.

By standardizing rim equipment we have cut down from 17 to 6 tire sizes on all vehicles to save carrying large stocks of spares. We follow the wide base rim recommendations and use tires large enough to carry the load-for example: on our half tonners we use size 7.00 x 15 commercial instead of 6.00 x 16. We use 7.50 x 20 tires on our $1\frac{1}{2}$ -ton trucks.

It has been a common belief that mud and snow tires don't wear as well and result in excessive rear end wear on regular roads. Because of the great amount of off-the-road service, we were forced to use these tires on many vehicles and find they do just

(TURN TO PAGE 78, PLEASE)



Service shops have their Gremlins, too . but they are not on speaking terms with MARQUETTE engineers because these men have designed versatile, low cost, easy to operate welding machines that stymie all of the favorite Gremlin tricks.

Fast, flawless welding will make a host of damaged automotive parts as serviceable as when new. No more waiting for hard-to-get replacement parts. Save time, money and critical war materials by making strong, permanent repairs the MARQUETTE way.

MARQUETTE Gives You-Low initial and upkeep cost . . . fast, easy, low cost operation . . . automatic voltage control . . . no
''magnetic blow'' . . all-asbestos
insulation . . . complete equipment
. . five models, 150 to 400 am-

Send for free, 24 page, illustrated booklet.

MARQUETTE MFG. CO., INC. MINNEAPOLIS.





USE CASITE!

★ Here's a simple, inexpensive way to keep your motors running at the peak of performance . . . Casite.

Casite cleans out power-destroying sludge and gum from vital areas...keeps them out. And Casite's oil-carrying ability speeds lubrication to close-fitting, high-friction parts. Naturally, a clean, well-lubricated motor runs better and lasts longer.

Casite should be kept in every one of your motors—all the time. Your maintenance records will prove its value.

THE CASITE CORPORATION . HASTINGS, MICHIGAN

CASITE

CLEANS OUT MOTORS . KEEPS MOTORS CLEAN

TVA CONSERVATION **CUTS COSTS**

(CONTINUED FROM PAGE 76)

as good a job on regular roads. They are noisier but wear just as well, without affecting rear end life.

We believe that as equipment gets older and parts harder to obtain it will be necessary for even more cooperation between driver and shop in order to keep up our transportation service to the point where it will contribute its part to the TVA's war ef-

Each of our garages is on a competitive basis as far as costs go, based on the ratio of garage costs to productive work costs. Our bulletins pass along suggestions and practices of benefit to the whole organization.

Since we don't hire our drivers and don't have that control over them, we write notes of commendation to those having outstanding records of careful, trouble-free driving. And in our TVA monthly publication, we have a

page of "orchids to drivers," praising those who make special efforts to take care of equipment. It shows re-END

(Please resume your reading on P. 36)

1-WHEEL TRAILER

(CONTINUED FROM PAGE 46)

routeman would take a trailer load of finished work on his outgoing trip in the morning and leave it at a country branch where it was unloaded while he continued on his route. During the day the branch reloaded it with unfinished bundles and when the routeman came back, loaded on his way to the plant, he hitched on the loaded trailer. Thus the one-wheel trailer handled a two-thousand pound load for the trip.

Many other such routes were worked out which kept their three trailers in use most of the time. Their records show a definite reduction in trips and a help in the government program requiring trucks to carry loads both ways. Apex uses 18 panel trucks for its city deliveries.

Several manufacturers build the one-wheel chassis.

(Please resume your reading on P. 47)

CLUTCH COMPLAINTS

(CONTINUED FROM PAGE 37)

A variation of more than .010 in. in the trueness of the bell housing parting line where the transmission case is bolted on will cause misalignment. Check with dial indicator gage. If misalignment shows up, correct by machining or using shims.

In some cases the bell housing is made in two sections, and care must be taken to make sure that the sections are accurately aligned with each other. Correct misalignment by machining of surfaces or by using

Clutch Installation

When installing the clutch assembly to the flywheel, care must be taken to tighten each bolt one turn at a time to prevent springing of the clutch cover. A bent cover will cause clutch chatter resulting in subsequent clutch failure. Also, be sure that there is no dirt between clutch cover flange and the flywheel, as this could cause misalignment.

(Please resume your reading on P. 38)



GATKE CUSTOM-BILT SETS

include the foremost brake lining developments-selected by men who know brakes on the basis of proven results for the particular unit.

Furnished for all makes and models of Trucks, Tractors, Trailers, Buses, Taxicabs, and Passenger Cars.

GATKE CUSTOM-BILT Brake Blocks and Liners give you plenty of extra values-

Smooth, non-grabbing action that adds miles to tire life.

Proper balance between Primary and Secondary Shoes for maximum stopping

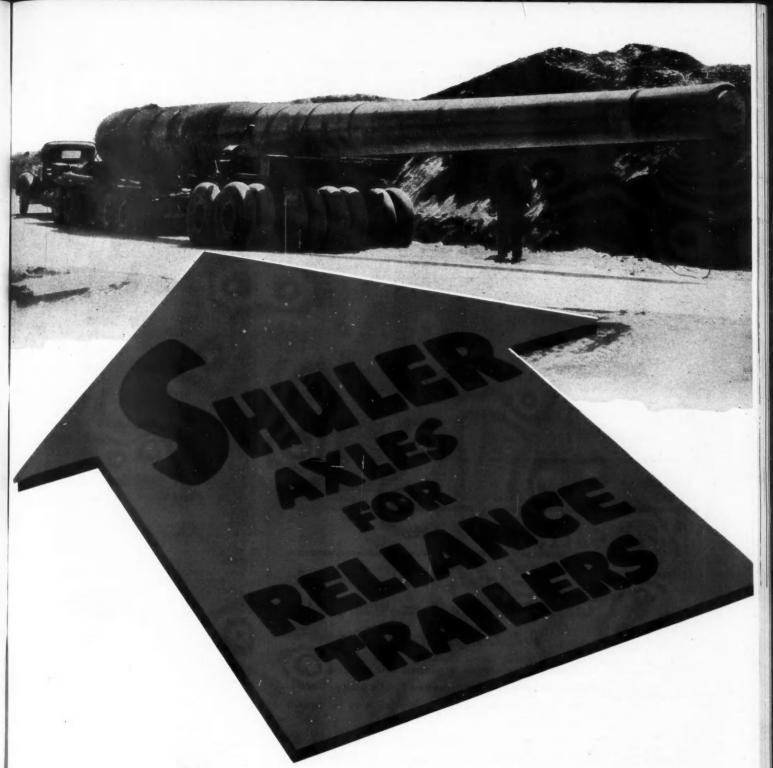
Dependable holding power under all conditions.

Long wear life that avoids adjustments and saves maintenance hours.

Whatever your equipment or service, the GATKE Simplified Survey System helps you get the proper brake liners CUSTOM-BILT for your requirements - with less time and

Ask your GATKE Jobber or write us.

CORPORATION 228 N. La Salle Chicago Introduced Moulded Brake Blocks for Automotive Service



WE won't attempt to tell you how much weight this -inch, -ton coast defense gun is putting on the mammoth Reliance Trailers (and Shuler Axles) that are moving it up into position—

—but we can tell you this: No matter what sort of equipment you're building or buying—or for what kinds of jobs—you can't get better axles than Shulers. That's not just our idea, either. It's the consensus of opinion among the people who build America's heaviest heavy-duty automotive equipment. . . . And some that's not so heavy, too!

SHULER AXLE CO., Incorporated, LOUISVILLE, KY.

Export Division: 38 Pearl St., New York, N. Y. West Coast Warehouse: Ford & Derby Streets, Oakland, Calif.

COMPLETE PM IN 10 STEPS

(CONTINUED FROM PAGE 45)

inspections and adjustments in 10,-000 miles of operation. The average lubrication and maintenance job is completed in 4 man-hours.

The 500-mile jobs are general in nature, the inspector covering the operation of the vehicle and certain reported items needing repairs. The lubricator lubricates the steering

gear, fan bearings, water pump, air compressor, drive shaft, shackles, etc., as well as checking the level of the crankcase oil.

The procedure calls for a detailed and thorough inspection and lubrication, however, at 1000-mile intervals. The entire vehicle is lubricated and the inspection mechanic has a planned schedule of things to check and adjust. The order of these items is controlled, some occurring every 5000 miles and others every 10,000. As previously mentioned, all are adequately covered, without excessive out-of-service time, every 10,000

The question of any major work or overhaul has been purposely eliminated from the above operations, due primarily to the inconsistency of attempting to schedule such operations either on a time or mileage basis. If we are basing all maintenance work on factual information. then we should have a reason for grinding valves, adjusting engine bearings, replacing piston rings, overhauling transmissions, etc.

Since tests can be made to ascertain the conditions involving major work on units-for example, compression pressure for valve condition, oil pressure for bearing condition, or oil consumption and blow-by for ring and piston condition-it is recommended that such major jobs be done only as indicated by the results of the inspection and tests on the particular item.

The details of our schedule and procedure are as follows:

INSPECTOR'S PROCEDURE

NOTE: This is not only an inspection. All necessary adjustments and replacements are to be made before the vehicle is returned to service.

- 1. The Inspector will go for the truck to be serviced. Enter the cab-note general condition.
 - Are the seat and back cushions in good condition?
 - Choke must operate freely and return to full "open" position.
 - What is the starter action?
 - Start engine, note smoothness of operation,
 - Does accelerator pedal operate properly? Note clutch pedal clearance.
 - Does gear shift lever work smoothly? Do the re-
 - verse and 5th gear locks work? w down all air tanks.
 - Check emergency brake: try starting with the emergency brake on.
 - Has the low air pressure alarm sounded? Pump up air noting compressor action. Move the equipment noting steering action.
 - Do the service brakes operate satisfactorily? Note speedometer reading.
- 2. Drive truck on to pit, stopping 25 feet from the head lamp screen. Try both beams. High beam hot spot must be on the black line set by the lubricator. Move truck forward onto Wee-Gee board being guided by the lubricator. If reading is off the zero point check other wheel and make or arrange for repairs.
- Pull hand brake on hard. If it approaches the limit of travel adjust band or shoes, With the hand brake lever set hard bump lever with the heel of the hand to check condition of ratchet
- 4. Record engine oil pressure both at idling and governed speeds.
 - Check governed speed if engine seems to race. Observe generator charging rate and action of ammeter, water temperature gage and speedometer. Have repairs made if units do not function
 - properly. Check play in steering.

Turn on all lights.
Check action of windshield wipers. Wipe blades
off clean. Set air wipers at 30 cycles a minute.

(TURN TO PAGE 82, PLEASE)



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American Brake Lining



Stopper the Pup is American Brakeblok's nationally known advertising character, appearing before 15,000,000 magazine readers every month!

COMPLETE PM IN 10 STEPS

(CONTINUED FROM PAGE 80)

Test turn signals and stop lights. Call left and right.

Adjust rear view mirrors

See that the spare fuse is in the holder.

Clean cab and tighten flag holders, check seal on flare box, and fire extinguisher, etc. Check air pressures in 2-qt. pressure type fire extinguisher.

Raise and lower the windows. Check all glass and arrange to have broken ones replaced

Check and record tire pressures. Correctly inflate all tires.

Remove imbedded glass, stones, nails, etc. Check

Remount where inner dual is larger than outer or where inner dual is more than 1/4 in. smaller as measured with a spirit level.

Inspect rims and tighten rim and wheel nuts.

Look for indications of wheel wobble. (Equalize adjustment of wheel nuts.)

Observe alignment of axles. (Sight along rear Arrange to replace bald, cut and poorly matched tires. Note reason for replacement of

Proceed with scheduled preventive maintenance items, see master chart (arrange to take care of those items missed due to failure of truck to come in for previous scheduled mainten

MASTER CONTROL CHART

SCHEDULES SHOULD BE PERFORMED AT 1000-MILE INTERVALS

L-Lubrication

Schedule 1-L&A-Tightening

- 2—L&B—Brake Check
- 3—L&C—Fan—Ignition
 4—L&D—Carburetion & Fuel Pump
- 5—L&E—Compression & Ignition
 6—L&F—Tightening

- 7—L&G—Brake Check 8—L&H—Cooling System
- 9-L&I -Electrical
- 10-L&J-Compression & Innition

10.000 MILES IS END OF FIRST CYCLE. SECOND CYCLE BEGINS AT SCHEDULE 1-L-A AND CONTINUES TO 10-L-J WHERE THIRD CYCLE BEGINS WITH 1-L-A, THE CYCLE REPEATS EVERY 10,000 MILES.

The lubricator assumes complete responsibility for the quality of the lubrication lob as well as for the uantity of lubricants used.

NOTE: The initial lubrication of units overhauled by the shop is the responsibility of the mechanic doing the work.

CONSTANT REFERENCE SHOULD BE MADE TO THE CHECK CHARTS AND PROCEDURE.

Many points are only lubricated at 1000-mile intervals. If previous lubrications have been missed both 500 and 1000 interval points are to be covered. 1. Lubricator will clean up around the pit, prepare his equipment, lubricate and pack his guns, place

lube form in holder, select check chart, remove history card from file, adjust cord on headlamp screen and place Wee-Gee board in position. 2. Assist inspector in locating truck for headlamp

3. Assist inspector in placing equipment on Wee-Gee

4. Check all lights. Note, for repairs, those that are not burning. Also those with dirty lens.

Observe test of turn signals and stop light.

If underside of chassis is very dirty help is to be secured at this time to start the cleaning opera-

6. DOOR HINGES AND LOCKS (1000-mile intervals)

a. Apply motor oil, light medium, to the hinge pins from the inside of the hinge. Open and close door a fe wtimes to permit oil to work

around the pins.

Apply a few drops of household lubricant to

door latches. Clean and tighten door keepers.

d. Apply a drop or two of oil to metal door checks.

e. Open, with a screw driver, the drainage holes in bottom of cab doors.

f. Take care of any lubrication fittings inside the

cab, using the correct lubricants. 7. HOOD, HINGES AND LATCHES (1000-mile Intervals)

Normally, start work on side of engine opposite to engine oil fill pipe.

Raise hood, moving it up and down to test for squeaks.

Apply a few drops of motor oil, light medium, to the hinges and latches.

Wipe off excess oil and again test for squeaks. e. Receat operations b, c and d on opposite side

of engine when it is reached. When engine is under the seat, oil hinges as the seat is raised.

Note any oil, gasoline, or water leaks about

the engine. Have corrected at once when found. Check for leakage around spark plugs, cylinder

head, timing gear case, and valve cover plates.

i. Clean sides of engine, the accessories, and other units.

i. Check tightness of all accessories such as vacuum tanks, horn, generator, starting motor, etc., and of their connections by shaking or pulling same.

k. Check gasoline filter bowl for cleanliness if engine is so equipped.

I. Clean strainer in carburetor.

8. FAN AND BELT (1000-mile intervals)

a. Lubricate as directed.

Check co

9. WATER PUMP (1000-mile intervals) nuts for leakagea. Check water pump gland

tighten if necessary.

(TURN TO PAGE 84, PLEASE)



The amazing economy and efficiency of the Lisle Pin Hole Hone is confirmed by the Detroit Auto Piston Company. They write: "We find it is much faster than anything we have ever used. Abrasives last from two to three times as long and we have been honing about 2,000 pistons with one abrasive paper."

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ON MANY a distant battlefront, fighting in the glorious cause of the United Nations, troop carriers move forward toward the thick of battle. Fighting men hold on grimly as the trucks advance . . . skirting shell craters, plunging into depressions, driving ever forward with a steady surge of power.

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INTERNATIONAL TRUCKS

COMPLETE PM IN 10 STEPS

(CONTINUED FROM PAGE 82)

- 10. COOLING SYSTEM
 - Fill radiator to proper level.
 - b. Inspect for leaks in radiator core, upper and lower tanks, inlet and outlet hoses, manifold, and uncer and lower pipe connections.
- 11. AIR COMPRESSOR
 - A. Check oil level—Add motor oil, medium in winter and heavy in summer, if needed.
 b. When compressor is lubricated by the engine
- lubricating system, compressor will be taken care of with the engine's crankcase oil. 12. HYDRAULIC BRAKE MASTER CYLINDER (1000-
- mile intervals)

- a. Check for leaks and loose connections.
 b. See that brake fluid is at its proper level.
 c. USE ONLY PRESCRIBED BRAKE FLUID.
- DO NOT USE A PETROLEUM OIL 13. DISTRIBUTOR WICK AND SHAFT (1000-mile
- intervals) a. Wipe the cap and body of distributor clean.
 - If equipped with lubricating fitting, use chassis lube. (A. R. Gun No. 1.) If equipped with grease cup, turn it down and refill with chassis lube.
 - Remove distributor cap and rotor, and apply not more than TWO DROPS of motor oil,
 - medium, to the wick in the center of the shaft.
 - c. Apply one drop of the same oil to the breaker arm nivet
- Clean the breaker cam. Have inspector clean and adjust points, if necessary.

- e. Apply thin coating of chassis lubricant to the cam with an applicator.

 f. Clean inside of cap and rotor and reassemble.
- 14. MAGNETO (1000-mile intervals)
 - a. Check support bracket bolts for looseness— have inspector tighten if necessary. b. Apply TWO DROPS of motor oil, light medium.
- to the oiler. 15. STARTING MOTOR AND GENERATOR (1000
 - mile intervals) a. Check support bracket bolts for looseness— have tightened if necessary. b. Apply TWO DROPS of motor oil, medium, to
 - the oilers on both the starting motor and the generator.
- 16. STEERING GEAR (Tie rod, drag link, pitman arm, and gear housing)
 - a. Use recommended lubricant of the proper seasonal grade.
 - b. Check all parts for looseness and wear-report
 - if tightening is necessary.
 c. check housing for grease leakage. Call to foreman's attention if case appears to be empty.
- 17. OIL FILTER
 - a. Service oil filter according to manufacturer's recommendations. (Follow closely.)
- b. Inspect oil lines and connections for leakage.

 18. AIR CLEANERS AND OIL BREATHER CAP (1000-mile intervals)
 - a. Service OIL BATH TYPE.
 - 1. Remove screen and immerse in kerosene for cleaning.
 - 2. Remove used oil from sump.
 - 3. Clean basin and refill with recommended seasonal grade of motor oil.
 - 4. Replace screen and cover.
 - b. Service SCREEN TYPE (Unsealed).
 - 1. Remove entire unit.
 - 2. Remove cover and felt pad.
 - 3. Immerse screen in kerosene and clean.
 - 4. Dry screen with compressed air.
 - Oil screen with motor oil, extra heavy. 6. Replace felt pad and cover. (Keep pad
 - dry.)
 - 7. Replace entire unit.
 - c. Service SCREEN TYPE (Sealed).
 - 1. Remove entire unit.
 - 2. Immerse unit in kerosene and clean.
 - 3. Dry with compressed air.
 - 4. Apply motor oil, extra heavy. 5. Replace unit.
 - VERY IMPORTANT-DO NOT OVERLOOK d. Service Oil Breather Cap. (If so equipped.)
 - 1. Remove and immerse in kerosene for cleaning.
- 2. Dry with compressed air.

 19. REFILL ALL OIL AND GREASE CUPS (1000mile intervals)
 - a. Check all oil and grease cups under the hood. b. Fill with proper lubricant.
- 20. OIL SPARK, CHOKE, AND THROTTLE LINK-AGE (1000-mile intervals)
 - a. Use motor oil, light medium. Apply drop or two at each joint of spark, choke, and throttlé linkage.
 - c. Check all connections for looseness or wear and for missing or broken cotter pins. Have necessary repairs made.
- 21. REMOVE MOTOR OIL GAGE AND BREATHER CAP (1000-mile intervals)
 - Remove motor oil gage stick and breather cap and place on cylinder head.
 - Allow hood on engine oil fill pipe side to re-main up—a reminder that crankcase oil is to be changed.
- 22. BATTERY AND CABLES (1000-mile intervals) a. Check battery with hydrometer.
 - b. Recharge if hydrometer reading is less than When the fast charger is used a daub of yellow paint is to be placed on one of the battery connector bars. Frequent use of the fast charger on any one battery is to be
 - c. Check water level using hard rubber gage stick or syringe.
 - d. Add distilled water to point where water level
 - will be % in. above plates.
 e. Check battery hold down clamps and tighten if loose, DO NOT SQUEEZE BATTERY CASE.
 - f. Clean corrosion and dirt from terminals, Check cable terminals. If corroded badly, advise
 - g. Check cable insulation for worn spots. Taep

(TURN TO PAGE 86, PLEASE)

Du Pont Announces A NEW PLASTIC "CAVALON"*

Synthetic Resin Coated Upholstery Fabric

AS YOU KNOW, the use of both crude and synthetic rubber has been almost entirely diverted to the war effort. This excludes the manufacture of rubberized upholstery fabrics for any purpose.

To relieve this war situation, the Du Pont laboratories have developed a new formula for "Cavalon" based on synthetic resin compositions. This is important news, because synthetic resins have become such a vital part of our war effort -may well become a vital part of our civilian industry after the war.

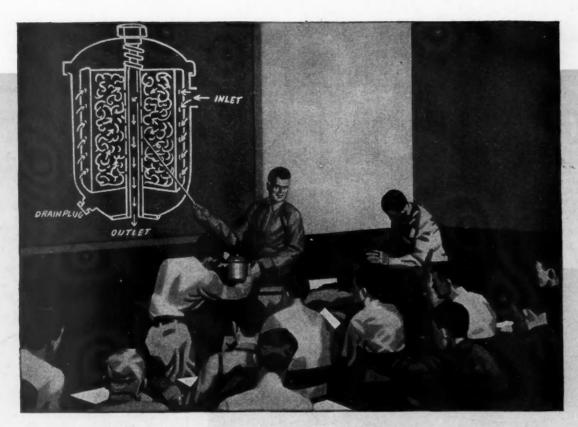
The new "Cavalon" formula using synthetic resins has been tried and proved in use on war order applications calling for an upholstery material to be supplied in accordance with Federal Specification E-KKL-136-A, Type 3 Class A & B. It gives an upholstery material of superior quality and resistance to exposure and general abrasive wear. It can be made in a wide range of colors and grains.

"Cavalon" has built a reputation as an outstanding development in the field of upholstery fabrics for heavy duty civilian service. Plastic "Cavalon" cannot be offered for public sale nowmilitary needs come first. After the war, you will be able to specify "Cavalon" when you want superior quality in a coated fabric for upholstery use. E. I. du Pont de Nemours & Co. (Inc.), Rubber Product Sales, Fairfield, Conn.

*Plastic "Cavalon" is Du Pont's trade mark designating its synthetic coated upholstery fabric-



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Those men with Technician's chevrons on their sleeves are the real McCoy. They are the fellows who keep 'em rolling and keep 'em flying. In their engine classes, they get the inside story of every part. And when it comes to oil, they usually hear the familiar instruction: "Keep it Clean with Purolator!"

Eighteen years ago, Purolator invented the oil filter. Today, the name is synonymous with filtration. Fortunately, this pioneering attracted other manufacturers to this field, so that today the combined production supplies filters for all our planes, tanks, naval vessels, merchant marine and all other mechanized equipment plus new elements for civilian cars, trucks and buses.

In these vital days of conservation, be sure to give your units—your cars and trucks and buses—military care by replacing Purolator elements regularly. Remember—keep it clean with Purolator.

Purolator Products, Inc., Newark, New Jersey . . . founder and leader of the oil filter industry.





COMPLETE PM IN 10 STEPS

(CONTINUED FROM PAGE 84)

- 23 BUMPERS PERS, LICENSE PLATES, FENDERS, STATIC CONNECTIONS
 - a. Make a complete circuit of the vehicle, check-ing the bumpers, license plates, fenders, static cable and all visible items for looseness. Tight-
 - b. REPORT ACCIDENT DAMAGE TO FOREMAN.
 - Inspect tank fill caps, paskets, fasteners and vents and seals. Each cap must lock securely or repairs are to be made before truck is
 - d. Fill hydraulic ocerator with motor valve oil. Report oil used.

 e. Lubricate unloading manifold cock.

- 24. UNDER THE CHASSIS-CLEANING (1000-mile intervals)
 - This and the next paragraph to be covered by both the inspector and lubricator.
 - a. Clean entire underneath part of vehicle.

 b. Use putty knife and wire brush for cleaning if
 - necessary.
 c. Inspect after cleaning such units as springs. axles, transmission housing, drive shaft, uni-versal joints, frame and cross members, cab
- and motor supports, king pins, drag links, tie rod, etc. 25. INSPECTING AND TIGHTENING

 - Replace missing universal joint flange bolts.
 Examine wear and play in clutch and brake pedals. Report if serious.
 Examine transmission case and crankcase for examine transmission case and crankcase for examine transmission.
 - cracks, leaks, and loose or missing bolts. d. Inspect drive shaft.
 - e. Check clearance between universal joint flanges and cross members or brackets.

- f. Check spring pads for looseness.
 g. Check rear axle housing for cracks and leakage
 of grease. Report if leaks are found.
- h. Inspect cross members where they join side
- i. Check body bolts and fastenings.
- j. Check power take-off and pump for leaks and
- 26. WIPE ALL LUBRICATION POINTS
 - a. Clean all lubrication coints and fittings before applying lubricants.
- 27. DRAIN CRANKCASE-DRAIN TRANSMISSION-DRAIN DIFFERENTIAL
 - DRAIN DIFFERENTIAL

 a. Drain crankcase with each 1000-mile lubrication. Close attention is to be paid to the
 condition of the oil draining from the crankcase. If free water is present or if oil is
 sludged it is to be reported.

 b. Drain and flush transmission and differential
- every 10,000 miles or seasonally.
 28. LUBRICATE ALL FITTINGS (1000-mile inter-
- -steering and shackles 500-mile intervals)
 - a. Start at right front shackle and proceed around truck lubricating all fittings requiring
- chassis lubricant.

 b. Lubricate drag link and tie rod, being sure the lubricant reaches the ball sockets and springs holding them.

 29. REFILL ALL GREASE CUPS (1000-mile inter-
- vals) a. Refill all grease cups with proper lubricant
- for the particular unit. 30. CLUTCH RELEASE BEARING

 - a. Follow manufacturer's recommendation.
 b. DO NOT OVER-LUBRICATE—USE EXTREME CARE
- JOINTS AND DRIVE SHAFT 31. UNIVERSAL SPLINES
 - a. Check universal joints and drive shaft splines for leaks with each 500-mile lubrication.
 b. Lubricate every 1000 miles unless otherwise
 - specified by manufacturer.
 c. USE LOW PRESSURE NOZZLE when apply-

- ing lubricant.

 32. WHEEL BEARINGS (NOT REMOVED)

 a. Apply Lubricant "A" (AR Gun No. 2) to fittings or grease cups on rear wheels if so equipped.
 b. Use low pressure nozzle and DO NOT OVER-
 - LUBRICATE.
- 33. CHECK OR REFILL TRANSMISSION—CHECK OR REFILL DIFFERENTIAL
 - a. Check transmission and differential with each 1000-mile lubrication.

 b. Replenish if needed with proper seasonal grade
- of gear oil.
 NOTE: On Internationals the lubricant level is to be
- kept 1 in. below the oil level hole.
- On all units be sure the vent is open. If vent is nissing it is to be installed at once. 34. BOOSTER BRAKE CYLINDER (10,000 miles or
 - 60 days) a. Service "booster" equipment every 10.000
 - miles or every 60 days.
 - Lubricate power cylinder with two ounces of Zerol. Remove pipe plugs and add oil.

 Remove piston rod clevis pin, loosen boot and rotate ciston several times.
 - d. Inspect connections, nuts, hose and copper tubing.
- 35. O'L ALL CLUTCH AND BRAKE LINKAGE (1000-mile intervals)
 - a. Lubricate all clevis pins and ball joints on the clutch and brake redal linkage. Use motor oil, heavy.

 b. Oil atmospheric valve on "booster" if so
- equipped. 36. REFILL ALL CUPS
- a. Refill all oil cups not previously serviced.
 b. Use motor oil, heavy.

 37. WIPE OFF SURPLUS LUBRICANT.
- a. Remove surplus lubricant from all fittings and lubrication points.
- 38. ON THE GROUND (FINAL) REFILL CRANK-CASE (1000-mile intervals)
 - a. Refill crankcase with proper seasonal grade of motor oil.

 - b. Replace oil gage.
 c. Replace breather cap on fill pipe.
 - d. Check oil level.

IN PECTION MECHANIC

The oil pressure is to be checked and leaks looked for before the vehicle is moved off the pit. The me-(TURN TO PAGE 88, PLEASE)



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CLAWSON & BALS, INC., Chicago

Packery Stocks in Principal Cities

COMPLETE PM IN 10 STEPS

(CONTINUED FROM PAGE 86)

chanic completing work will road test vehicle giving particular attention to those units or parts which have just undergone repairs and adjustments. The vehicle is to be placed in its regularly assigned stall and its return to service is to be noted, at once, on the TeleAutograph.

39. COMPLETE INSPECTION FORM (LUBRICATOR)

- a. Sign for completed lubrication.
- b. Insert card showing mileage of next lubrica-tion in card holder.
- Replace history card in file.
- d. Clean pit in preparation to receive another

LUBRICATION AND MAINTENANCE REPORT FORM

All individuals having to do with this lubrication and maintenance are to sign the report. The foreman on duty at the completion of the work on each vehicle is to initial report and mark, in blue, those items to be recorded in the office file.

SCHEDULE A & F

This schedule will be followed at 1000, 6000, 11,-000, 16,000, 21,000, 26,000, 31,000, etc., intervals as indicated by speedometer.

The inspection and tightening of all unit fastenings and frame parts is necessary.

Start at the front of the vehicle and work towards the rear, checking and tightening all nuts and inspect-ing and noting loose rivets. Loose rivets should be replaced, later, by new ones, or body bound bolts.

- 1. Check radiator mountings. Tighten if necessary.
- 2. Check engine mountings. Tighten if necessary.

- 3. Check front spring clips, bolts and nuts. Tighten
- Note broken spring leaves.
- 5. Check spring shackles and shackle brackets. Note if hushings are badly worn.
- If necessary set front wheel stops,
- 7. Tighten king pin draw keys if necessary.
 8. Examine brake and clutch pedal supports.
 9. Check tightness of transmission fastenings, emer-
- gency brake hanger brackets, power take-off, etc.
- Tighten if necessary.

 10. With a bar, check companion flanges for play.

 Note if repairs are necessary.
- Tighten universal joint bolts.
- 12. Check joints for wear.
- 13. Check rear spring clips, bolts and nuts. Tighten
- if necessary.

 14. Note broken spring leaves, overload pads, helper
- spring leaves, etc. 15. Tighten torque rods, radius rods, etc.
- 16. Tighten differential carrier to housing.
 17. Inspect cross members and side rails for cracks and loose bolts or rivets. Tighten loose bolts. Note loose rivets.
- 18. Tighten cab and body fastenings.
- 19. Inspect exhaust pipe, muffler and tail pipe for leaks. Make sure tailpipe does not permit exhaust gases to strike against differential housing
- 20. Check brake linkage nuts and cotter pins. Make corrections where necessary.

SCHEDULE B & G

This schedule will be followed at 2000, 7000, 12,-000, 17,000, 22,000, 27,000, etc., intervals as indicated by speedometer.

This operation consists of a casual brake lining and

- drum inspection and a minor brake shoe adjustment.

 1. Jack up one wheel at a time, chocking another wheel on the same side of the truck.
 - 2. Examine the lining thickness through window
 - 3. Estimate the remaining life of lining.
 - 4. Adjust wheel hearings following manufacturer's recommendations.
 - Make adjustment of brake shoes if necessary.
- 6. Check rear wheel alignment.

Refer to brake manufacturer's instructions for adiustments

This schedule will be followed at 3000, 13,000, 23,000, 33,000, etc., mile intervals as indicated by 1. Check fan and fan belts. Check condition of

- bearings, bearing adjustment and tightness of hanner. Adjust belt to maufacturer's tolerance. Clean fan blades and check for cracks.
- 3. Note clearance of blades to engine, hanger, radiator core, etc.
- 4. Belts should be replaced if adjustment is all the way out and the belt still loose, or condition of belts poor.
- 5. Remove distributor cap. Inspect points, cap. rotor, etc. Test condenser. Test coil.
- 7. Follow manufacturer's instruction on testing and ignition setting.

SCHEDULE D This schedule will be followed at 4000, 14,000, 24,000, 34,000, etc., mile intervals as indicated by

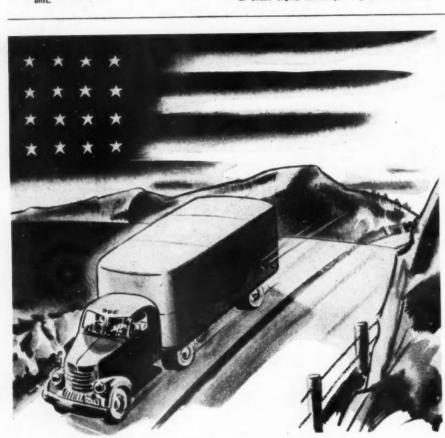
- the speedometer. 1. Install reconditioned carburetor. Check carburetor linkage.
- 2. Adjust idle.
- 3. Check fuel pump for pressure and flow rate.
- 4. Adjust governor.

SCHEDULE E & J

This schedule will be followed at 5,000, 10,000, 15,000, 20,000, 25,000, etc., mile intervals as indicated by the speedometer.

- 1. With a warm engine the plugs removed, carburetor dry, and the throttle wide open:
 - a. Plug in compression gage.
 b. Crank engine with starter a minimum of six compression strokes per cylinder. Note reading on record card. If compression is below manufacturer's recommendations, fore-
- man should be advised immediately.

 2. Inspect the spark plugs. Determine if a change of heat range is necessary from appearance of old (TURN TO PAGE 90, PLEASE)



SEMI-TRAILERS ALSO SERVE

These days the goods must go through.

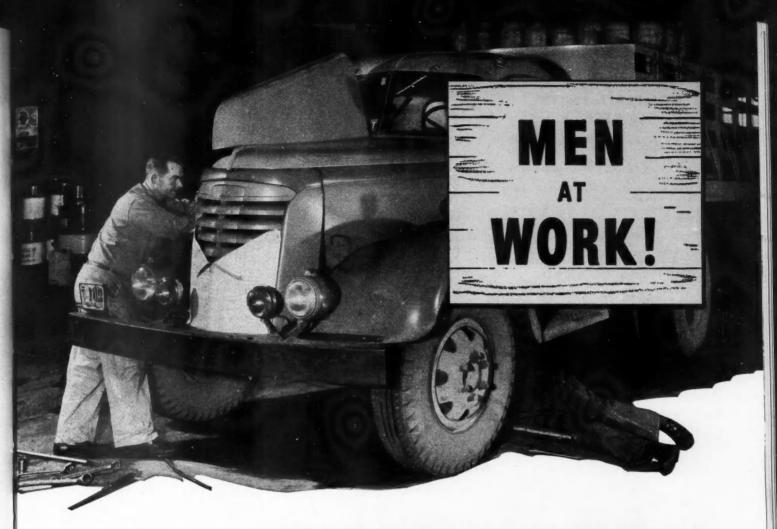
We've a war to win and need the materials to win it with. The truckers are doing a job to the best of their ability. Highways and by-ways are seeing semi-trailers on the job night and day. Helping production keep pace with demands and helping to keep the home fires burning.

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And here at Edwards we are doing a wide range of work which will contribute to Victory.

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EDWARDS IRON WORKS, INC., SOUTH BEND, IND.



another reason YOUR NAPA JOBBER is A GOOD MAN TO KNOW

● It takes men at work—all the good shop men you can muster nowadays-to keep the nation's motor transport rolling under the tremendous load of war-time industry. Trucks can't get out of the shop as quickly as they should if service men must shop around for parts and supplies.

That's why your NAPA jobber, backed by a nation-wide organization, is a good man for you to know.

Master stocks of more than fifty essential lines of parts and materials are maintained by 38 NAPA Warehouses, located in every section of the nation. More than 1800 jobbers make these warehouses their primary source of supply.

In so doing, they avoid having to wait for "shipment from the factory"-and the NAPA seal that identifies these lines gives you double assurance of their quality.

Read the list of NAPA lines shown below. Consider the exchange and machine shop services available, and the advantage of nearby warehouse service. They're all reasons why your NAPA jobber is a good man to know, when men at work are what you need!

NATIONAL AUTOMOTIVE PARTS ASSOCIATION . EXECUTIVE OFFICES: 705 FOX BUILDING, DETROIT

THESE ARE THE PRODUCTS WHICH CARRY NAPA'S ASSURANCE OF QUALITY

AMERICAN BRAKEBLOK Brake Lining, Clutch Facings, Fan Belts, Radiator Hose

ALLIED-A P C Nukrome Valves, Valve Guides, Pin and Boss Bushings

ALLIED-PRECISION ALLIED-RAYMOND Valve Springs and Keys ALLIED-WISCONSIN Pietons, Cylinder St

CELORON-Timing Gears

BELDEN ELDEN
Spark Plug Wire and Sets,
Primary Wire and Looms,
Battery Cables, Cordlites
and Soldering Irons BROWN-LIPE

BUFFALO Mufflers and Tail Pipes

Drive and Pinion Flywheel Gears, Axie Shafts, Differential Parts DUCKWORTH Timing Chair ECHLIN

DETROIT—Universal Joints

DITTMER
Transmission Gears,
Shafts, and small parts
DOUBLE DIAMOND

CHLIN
Ignition Parts, Colls,
Testing Instruments,
Electrical Bushings FEDERAL Ball Be

GRAPHO—Water Pur and Parts, Packing MARTIN-SENOUR Spraying Lacquers, Synthetic Enamels,

Painter Specialties, Thinners, Reducers

MONMOUTH
Clutch Plates and Parts,
Engine Bearings,
King Bolt Sets NEW BRITAIN

PURITAN
Hydraulic Brake Fluid,
Shock and Knee-Action Oil
Gasket Seale

RARITAN -Rotter B SPICER-Universe STANDARD

Oil Scals and Grease Retainers, Gear Adjustment Shims

UNITED

Hydraulic Brake Parts Brake Cables, Fuel Pur Parts, Speedomet Cables and Parts

A NATION-WIDE ORGANIZATION OF INDEPENDENT WAREHOUSING DISTRIBUTORS

COMPLETE PM IN 10 STEPS

(CONTINUED FROM PAGE 88)

plups. Clean and test. Note if replacement is necessary.

- necessary.

 3. Check valve tappets. Reset clearance to manufacturer's recommendation.
- 4. Check engine ignition timing using the timing light.

SCHEDULE H

This schedule will be followed at 8000, 18,000, 28,000, 38,000, etc., mile intervals as indicated by the speedometer.

- 1. Drain cooling system.
- 2. Remove thermostat.

- Clean system thoroughly using both a grease and a scale solvent. Flush thoroughly after each solution.
- 4. Note condition of hose.
- 5. Note condition of pump.
- 6. Replace thermostat.
- 7. Refill cooling system.
- Clean the outside of the radiator core using a kerosene spray followed by flushing with the 300 car washer.
- Check fan and fan belt. Check condition of bearings, bearing adjustment and tightness of hanger. Adjust belt to manufacturer's tolerance.
- 10. Clean fan blades and check for cracks.
- 11. Observe clearance of blades to engine, hanger, radiator core, etc.
- Belts should be replaced if adjustment is all the way out and the belt still loose, or condition of belts roor.

SCHEDULE I

- 1. Inspect distributor points, wires, etc. Lubricate cam and felt.
- 2. Check carefully all wires and wire terminal connections, fuse block, control switches, etc.
- Make repairs where necessary.

 3. To assure the delivery of the full battery voltage to the coil, lights, etc., it is necessary to make a step by step check of the electrical system, using a low range voltmeter, for all low tension wiring.

CAUTION: Do not use low range voltmeter on any high tension wiring of the ignition system.

SCHEDULE J

This schedule will be followed at 9000, 19,000, 29,000, 39,000, etc., mile intervals as indicated by the speedometer.

- 1. Inspect distributor points, wires, etc.
- Check carefully all wires and wire terminal connections, fuse block, control switches, etc. Make repairs where necessary.
- repairs where necessary.

 3. To assure the delivery of the full battery voltage to the coil, lights, etc., it is necessary to make a step by step check of the electrical system, using a low range voltmeter, for all low tension wiring.

CAUTION: Do not use low range voltmeter on any high tension wiring of the ignition system.

END

(Please resume your reading on P. 46)

Army to Cut Parts Varieties

A major job of "simplifying" the Army's future mechanized equipment is under way to eliminate the terrific supply and maintenance problem existing now because of the many varieties of vehicles, parts and accessories, according to officers and engineers of the Ordnance Department's Tank-Automotive Center.

For example, there are in the present series of 14 tactical motor trucks eight different types of generators, 11 kinds of starting motors and 11 varieties of batteries. Each of these components should be reduced to not more than four or five types and sizes. A distributor functions the same on any six-cylinder engine, so there is no reason why the present galaxy of eight separate distributor models shouldn't be reduced to two or three. The condition is the same all down the list of parts and accessories; 10 different air cleaners, 12 different clutches, 10 types of starting gears-a basketful of varieties when a handful may serve.

This complexity of parts requirements greatly hinders the efficient upkeep of vehicles in the field. To help solve the problem, the Tank-Automotive Center's Development Branch, headed by Lt. Col. Joseph M. Colby, has activated a "Simplification Section" with Ltd. Col. Frank A. Mickle, former associate professor of mechanical engineering at the University of Michigan, as chief. This section, under the supervision of Assistant Branch Chief C. W. Kynoch, will attempt to "streamline" the mechanism of the mechanized forces.

Taylor Chain Gets Joint "E" Award

The S. G. Taylor Chain Co., Hammond, Ind., manufacturers of load and tire chains, received the Army and Navy Joint "E" Award. Acceptance in behalf of the company and employees was made by E. Winthrop Taylor, president.

Protect Plane Refuelers



Note particularly the installation of the governor with a positive drive from the front of the timing gear cover, making possible tamper-proof governing and most efficient aperation.

HOW TO MAKE YOUR GOVERNORS LAST!

Like others manufacturing for war needs, Pierce production is for war and essential industry. Far this reason new governors can be supplied only on a priority basis. But Pierce calls attention to these easy measures which will make your present Pierce Governors last and give the best service.

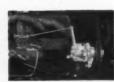
- CLEAN GOVERNORS once a month with kerosene, gasoline, or prepared cleaner.
- INSPECT AND CHECK GOVERNORS each week when in continuous operation.
- CHECK OIL LEVEL every day in manually lubricated governors. SAE 20 Oil is recommended at this time of year.
- LINE UP driving pulleys or gears accurately when reassembling governor after cleaning.

Should your governor need repair or reconditioning send it to the factory with the necessary preference rating certification.

WHEREVER Uncle Sam's eagles of the sky are poised to strike . . . these sturdy refueling units keep them supplied with high octane gasoline. And that's a task that takes the tractor over all sorts of roads and terrain with its heavy load. To protect the Reo engine against excessive speed, as well as sudden violent load-changes, it is equipped with a Pierce Flyball Governor. Pierce's time-proven flyball design provides simple, mechanical operation that is positive and unfailing, regulating engine speed instantly to meet any change in load. And sturdy precision construction makes Pierce Governors serve better and last longer.

THE PIERCE GOVERNOR COMPANY 1611 OHIO AVENUE, ANDERSON, INDIANA

This universal type Pierce Flyball Governor is driven from the fan belt, and can be installed on any make or model of truck where a direct driving outlet is not provided. This model is still available with the necessary preference rating certificate.







Yours is the essential wartime job of transporting vital supplies. To do this efficiently, dependably and safely puts heavier demands upon brake lining.

Raybestos Heavy Duty Brake Lining successfully meets this challenge because it is built with a 300 per cent margin of safety. It withstands loads and constant temperatures far greater than encountered under the most severe operating conditions. You experience longer wear, fewer lay-ups, better maintained schedules.

For today's tougher job of delivering the goods, give every truck in your fleet Raybestos margin of safety performance—now.

THE RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., BRIDGEPORT, CONN.

Ray beatos

AMERICA'S BIGGEST SELLING

BRAKE LINING

YOUR 2

BEST FRIENDS

for
HIGHWAY
SAFETY

BRAKE LINING, CLUTCH FACINGS, FAN BELTS, HOSE • FOR CARS, TRUCKS, BUSES, TRACTORS • ON THE WAR AND CIVILIAN FRONTS

CANADA'S WARTIME TRUCK CURB

(CONTINUED FROM PAGE 47)

are now being made. Trucks are not available for civilian uses without special permits.

Nation - wide gasoline rationing went into effect in Canada early in 1942, and trucks were issued ration books as well as passenger cars. While the original unit was set at five gallons, it has been cut to three gallons since late in 1942. Trucks

are not rational as to amount; can obtain all that they normally require. But with all truck operators having to turn in gasoline ration units for gasoline used, the Oil Controller's office is able to keep a close check on the amount actually used and the amount which the truck operator had given as his normal requirement. Should the truck use more, an investigation is immediately made, and the controller has authority to call in the ration book should the use of the truck in excess of normal use be for

non-essential purposes. Thus to save gasoline, and tires also, trucks may no longer be used on Sundays or other days to take out picnic crowds; must be used only for essential civilian or war services.

To conserve manpower, gasoline and tires a number of civilian delivery truck uses have been cut down. Thus retailers may make only one delivery daily on any route, and then only on orders over \$1 in value except perishable goods, fuel, bulky merchandise and a few other special commodities. Wholesalers can only make deliveries three times weekly. as can cleaners and launderers, and icemen. Bakers are restricted as to use of delivery trucks if their sales from each truck amount to less than \$225. Brewers may only deliver in certain areas. And on Dec. 28, 1942, a ruling, twice previously postponed, went into effect that no privately owned truck or trailer may be used for deliveries beyond 35 miles of its registered address without a special permit from the Services Administrator of the WPTB.

Because 90 per cent of all trucks on the road in Canada are those used by firms for their own haulage, the 35-mile regulation was put into force to cut down on the loose ends of the trucking business. Special permits will be given where it can be shown that they are needed. Certain classes of truck users as farmers, public utilities, police services, oil services, garages, repair work of certain types, are exempt from the order. Owners of private fleets are able to obtain permits for a limited number of vehicles on specific routes to go beyond the 35-mile limit if return loads are available. Thus, chain stores with private fleets can supply their various outlets from central warehouses with permit.

To insure private fleets not being turned over to for-hire carriers so as to evade the 35-mile limit regulation, common carriers have had their equipment frozen; may not add to their fleets without a permit. Under another freezing regulation, affecting practically all civilian business in the Dominion, no new business may be started without a permit; no firm may move to larger quarters without permit; and no firm can engage in another business which it had not carried on previously. This regula-

(TURN TO PAGE 94, PLEASE)





Two-Fisted Oil

WITH EVERY MINUTE COUNTING, and maintenance doubly important, the use of a "doubtful" oil is next to sabotage. War materials must get through on time.

To "keep 'em rolling-longer" operators are turning to the iubricants that are tough enough to stand the pace. That's why you'll find Shell Diesel and gasoline engine

oils, chassis lubricants and greases number one in scores of the country's leading truck and bus fleets. Shell Automotive Lubricants have proved they have the stuft.

Let the Shell man tell you about the plan that has helped operators chop down maintenance costs, increase engine efficiency, prevent costly delays. Call him in today!

OIL IS mmunition WISELY

utomotive

For Heavy Duty

CANADA'S WARTIME TRUCK CURB

(CONTINUED FROM PAGE 92)

tion covers the trucking industry as well as other civilian industries. Only for specific war work will permits be granted for new firms, movement to larger quarters, added lines of business.

While these are the main restrictions, insofar as the actual use of trucks is concerned, there are others and more are contemplated. Among those planned, some of which may be in force by the time this appears in print, is one which will call for a pick-up and delivery deadline at 4 or 5 p. m., so that truckers will not have to work as laste as they do now, thus helping manpower conservation. It is also expected that there will be a tightening up of gasoline and tire use for trucks; that more delivery of civilian goods will be curtailed; and that some pooling arrangements for house-to-house food deliveries among

bakeries and dairies will be worked out.

Incidentally, bus operators have been limited to sell passenger fares only for less than 50-mile, one-way trips; all new buses going into service are being painted a khaki color, making them easily interchangeable on routes anywhere in Canada; taxis are to operate only on essential calls such as to hospitals, depots and hotels.

Canadian truck owners are faced with the same difficulties in obtaining parts as are American truck owners. The tire situation is about the same, but furniture moving vans, whether for local or long distance use, are not treated in the same priority as other common carriers. Tire priority in Canada goes first to trucks used in war work and essential transportation; then to trucks used for hauling essential raw materials; to semimanufactured or manufactured products to or from munitions plants without other adequate transportation; to trucks or buses on regularly established passenger or freight service; to transportation of perishable foods which cannot be transported otherwise; then to other vehicles with the local tire rationing representative giving priority rating.

With Canada well into its fourth year of the war, the manpower situation is much tighter in the Dominion than in the United States. Of Canada's 11,500,000 men, women and children, the end of 1942 saw over 1.000,000 in direct war work, and 650,000 in the armed services. How many from the trucking business have gone into war work or the fighting forces is hard to estimate. The forhire motor transport companies, in a brief of the Canadian Automotive Transportation Association to the National Selective Service at Ottawa last October, estimated that between 25 and 35 per cent of its employees had enlisted since war began, and that the freezing of wages in December, 1941, saw another 20 per cent leave the trucking industry for more money in war plants. There is a definite shortage now of competent labor suitable to maintain the service necessary for the delivery of war materials and essential civilian needs. New help can only be obtained through local offices of the National Selective Service organization.

(TURN TO PAGE 96, PLEASE)



WARNER ELECTRIC BRAKE for SIMPLICITY.

A connection to the truck battery is all that is needed. Nothing special is required.



Only a few flexible wires. Nothing to freeze or chatter. No complicated mechanisms.

PLUGS IN AND OUT



The plug-in cable provides current for brakes, tail light, stop light and running lights.

★ With Warner Electric Brakes, there is full clearance under tractor and trailer — nothing to get knocked off or leak — no exposed braking equipment — no rods to rattle — no tubing to split — no condensation to freeze. Warner Electric Brakes require only a wire to each wheel and will operate under water without short circuiting. Minimum maintenance cost.

Right now, the needs of our armed forces come first! However, if you are on the "essential" list we can supply you with brakes.

WARNER ELECTRIC BRAKE



MANUFACTURING COMPANY

CANADA'S WARTIME TRUCK CURB

(CONTINUED FROM PAGE 94)

Pointing out the need of adequate labor for the trucking industry, the Automotive Transport Association of Ontario, the province where most truck transport in Canada is centered, made a survey of the goods hauled by its members on a day picked at random, it found that 73.6 per cent of the goods handled were for war plants, military camps, depots and airfields; 17.9 per cent were for essential civilian needs including foodstuffs, building materials; and only 3.7 per cent of the freight carried could be classed as luxury commod-

With price and wage ceilings going into effect in December, 1941, there was also announced a cost-of-living bonus for each 1 per cent of cost-ofliving rise as published quarterly by the government's Bureau of Statistics. There has only been one such increase in the first year of ceilings operations. This bonus must be paid by trucking operators to their employees. At the same time, their freight rates are frozen; their operation costs are going up; and they are paying 100 per cent on excess profits over the 1936-1939 average, with 20 per cent of the tax returnable after the war. No employees, executives or owners may have salary increases unless they are given more responsible work, are promoted, or unless nominal annual increases have been the custom. Similarly, only bonus payments which have been made in previous years may be paid under wartime financial regulations, with permission first obtained. Truckers must also deduct income tax and forced savings from payrolls and remit to Ottawa.

Canadian truck operators have instituted pooling plans whereby truck mileage can be saved, exchanging duplicating routes; pooled warehouse facilities; dropped feeder lines; established control offices for the dispatch of highway equipment with full loads. Where routes are dropped or exchanged with other operators, government franchises are protected, and the operator can obtain his route again after the war. The pooling has been on a voluntary basis among operators through associations or at the suggestion of wartime government controllers. Likewise, repair and preventive maintenance programs have been launched by associations to help members keep their equipment in the highest state of running order.

Canadian fleet operators have helped the government's various financial drives by painting their trucks with appeals for the purchase of war bonds, stamps and certificates. In pre-Pearl Harbor days, when American tourists were wanted in Canada, Canadian trucks and trailers, operating in border areas, advertised invitations to visit Canada. Canadian truckers have been anxious to see American trucks travel the short cut from Chicago to New York via southern Ontario, with needed war goods in bond, and aided in getting this legislation passed.

"Today, with all of the restrictions and controls which industry is facing," stated Wartime Prices and

Trade Board Services Administrator (TURN TO PAGE 98, PLEASE)



EVERY BEARING YOU SAVE today is a bearing saved for VICTORY. For bearings are a VITAL defense need. They should be washed, dried and repacked at least every 5,000 miles to prevent abnormal wear. Keep them clean, that

"Keeps 'em Rolling".
To do a "factory job" of washing, drying and repacking bearings, service men are buying "Croft" equipment. It pays big dividends in time and labor and in longer bearing life. Ahlberg jobbers can

supply you with this scientifically designed bearing service equipment.

Of course, when bearings must be replaced use Ahlberg Ground Ball Bearings. Scientifically re-processed and guaranteed to give new bearing performance. Ahlberg Ground Bearings have been a standard with large fleets and bus operators for thirty four years. and bus operators for thirty-four years.

Power washing removes every trace of old lubricant and dirt.



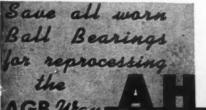
Compressed air blast blows the bearing perfectly clean and dry.

* * *

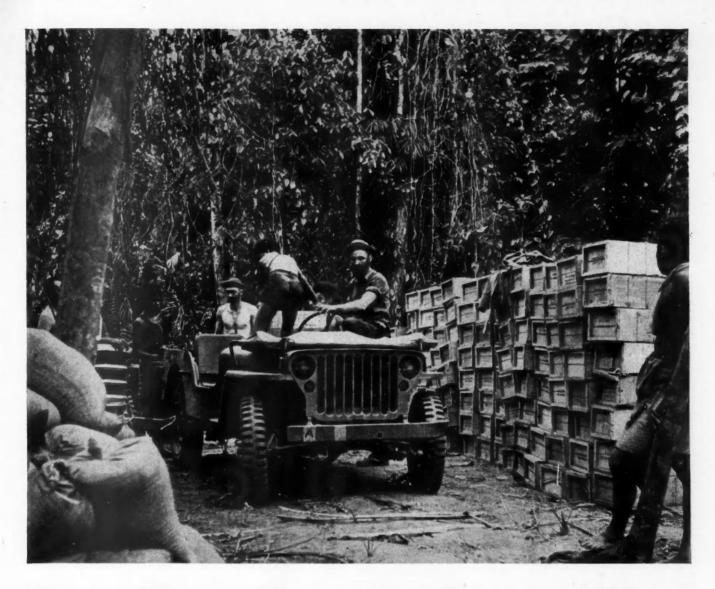


RE-PACKS

New lubricant forced into every part of the bear-



* 3006 WEST 47th STREET . CHICAGO. Out West its PRECISION BEARINGS, INC.



How They Pass the Ammunition in New Guinea

A typical example of B. F. Goodrich development in truck tires

In JUNGLE-MATTED New Guinea most of the fighting is an inch-by-inch, tree-by-tree affair. It's primitive country where mechanized equipment counts heavily—but where it's mighty tough to use it.

Here American-built Army trucks have an unromantic but important job of hauling ammunition and supplies to the front.

As well as tires for this purpose, B. F. Goodrich builds a special combat tire, designed to keep on rolling when hit with rifle and machine gun bullets. Other tires in Army service have super-traction treads that carry heavy trucks through mud and gumbo, across rivers and ravines, over swamps and deserts. Still others are special tires made with B. F. Goodrich synthetic rubber—Ameripol.

B. F. Goodrich has gone "all out" for war production, but that means taking care of essential civilian requirements, too—with tires designed to give the greatest possible mileage for every pound of rubber used.

And many of the truck tires we are offering owners with ration certificates today are exactly the same as those used by the U. S. Army!

When you must buy, get good tires. B. F. Goodrich Speedliner Silvertowns for trucks and buses have an amazing record for long mileage in all types of service. They are built with a broad, flattened tread construction which gives more miles per pound of rubber.

And some day they may be made with Ameripol synthetic rubber. When they are, remember that eighteen months before Pearl Harbor B. F. Goodrich was first to offer American car owners tires made with synthetic rubber.



(CONTINUED FROM PAGE 96)

James Stewart recently at the Automotive Transport Association of Ontario annual meeting, "it behooves every one of us to co-operate one with the other. If we do, the over-theroad transportation system should emerge from this war stronger and more efficient than it was when the conflict started."

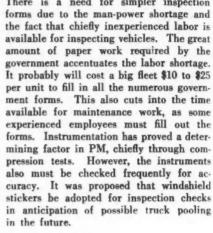
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SAE REPORTS

(CONTINUED FROM PAGE 49)

as a guide for the small fleet operator. In the past, PM has been on a mileage basis. This might be retained in part but it should be more flexible. He recommends a sub-group, in the appendix to the paper, on tractor-trailer couplings. There is need to simplify the paper work as much as possible. Fleet operators now must undertake much of their own inspection due to service shops being loaded with repair work. Small fleet operators must depend on their own drivers for inspection. He suggests a supplemental procedure of a daily inspection period to insure PM.

General: A standardized maintenance procedure would help manufacturers. There is a need for simpler inspection in the future.



SUBSTITUTE MATERIALS— HAVE WE GONE THE LIMIT?

by John G. Wood and R. F. Sanders. Chevrolet Division, General Motors

Throughout the industry it has been the policy not to sacrifice durability of items involving safety. When substitution of material became necessary for forgings in steering knuckles, steering arms, and other axle and steering parts, exhaustive tests were made to obtain equally as good or better life with the substitute material so that no failure of parts was invited which would involve the lives of men. We probably have not reached the limit of substitutions. considered from a standpoint of war materials. It stands to reason that if we are forced to use lower grade materials than those being presently used. then ways and means will be found to do this. If in the case of steels, we reach the point where no alloys are available, then a lot of redesigning of parts will be necessary and interchangeability may be sacrificed in some instances.

Therefore, to the question, "Have we gone the limit of substitutions?" the answer is definitely "no." How far we must go from this point on will depend entirely upon the supply of materials.

If we attempt to look into the postwar possibilities of substitute materials. the conclusions are that economics will be the principal factor that will determine the situation. For example, when nickel and chromium are no longer restricted, it is more likely that such elements will be used extensively in steels to replace lower grade alloys, and

(TURN TO PAGE 100, PLEASE)



Greater Protection to meet WARTIME CONDITIONS...

THE CARTER Ceramic FUEL FILTER is the greatest protection against unnecessary carbureter trouble caused by dirt or other foreign matter.

In these critical times when we've got to "keep 'em rolling" for the duration, this protection is of greater importance than ever.

Order from your Carter jobber or distributor.





CARTER CARBURETOR CORPORATION . St. Louis, Missouri

DIVISION OF AMERICAN CAR AND FOUNDRY COMPANY

SAE REPORTS

(CONTINUED FROM PAGE 98)

while it may be that the cost of the basic raw material is higher in the case of the better alloys than in the lower alloys, the heat treat range is greater and the handling cost in processing is thus lower and the overall cost is less.

In the case of aluminum, there is a general belief that its cost will be much lower after the war because of the widely expanded production facilities, and if this becomes a reality, no doubt it will be more extensively used.

As to the outcome of the position of rubber versus synthetics, this will most certainly be determined by the relative cost as in most instances there is no particular advantage of one over the other.

INFLUENCE OF VISCOSITY ON CYLINDER WEAR

by H. A. Everett, Pennsylvania State College

Oil viscosity definitely has an influence on cylinder and ring wear.

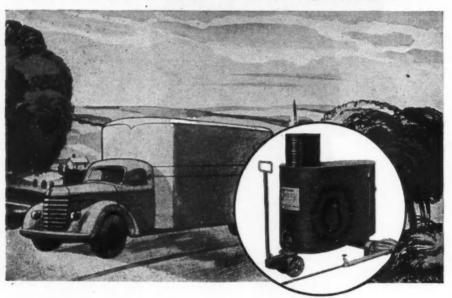
From the results of tests made on two groups of six engines each, using six oils ranging from a viscosity lighter than SAE 10 to a viscosity greater than SAE 70, the following conclusions were reached:

Wear of piston rings and cylinder walls is the greatest single item of wear in the modern automotive engine. While under normal service conditions such mechancial wear is slight, the process is continuous and is materially influenced by such factors as (a) operative conditions, (b) characteristics of fuels and lubricants and (c) the composition and surface condition of the parts themselves.

The tests further showed that cylinder and ring wear was very slight, in no case was scuffing or noticeable abrasion evident, and the internal surfaces were all comparable to the cylinder interior usually encountered in well maintained engines. However it was evident that the lower the viscosity the higher the wear even though the maximum may be well within the limit considered acceptable for good service life.

From these results it appears that the cylinder and ring wear in well-lubricated engines decreases progressively with increasing viscosity throughout the range tested, the wear being almost inversely proportional to the kinematic viscosity.

It's Road Time that Counts!



Hypressure Jenny Steam Cleaning SHORTENS LAY-UPS 50%

Fleet Operators who use Hypressure Jenny to steam clean truck chassis, motors, parts, etc., before inspection, repair, or overhaul, shorten lay-up time in the shop by as much as 50%. That means more road time; and it's road time that



counts! What's more Hypressure Jenny steam cleaning "ups" pay-loads by removing 50 to 400 pounds of deadweight dirt from every truck; saves up to 40 cents out of every labor-repair dollar on maintenance work and often prevents breakdowns by exposing cracked or worn parts for repair, before they give serious trouble. Add the savings and convenience of faster, better cleaning of floors, pits, etc., and you have good reason for installing Hypressure Jenny NOW.

HYPRESSURE JENNY DIVISION OF

HOMESTEAD VALVE MFG. CO.

P. O. BOX 90 CORAOPOLIS PENNSYLVANIA



CORROSION OF BEARING ALLOYS

by L. M. Tichvinsky,

U. S. Naval Engineering Experiment Station

Prior to the war tin was one of the predominating constituents used in bearing alloys. Now, however, with practically all of the tin supply cut off, many bearings have to be lined with various tin substitute materials.

Laboratory experiments were conducted to determine the corrosion resistance of various bearing alloys, when tested with straight, with additive-type and with re-refined lubricating oils at elevated temperatures. Some of the experimental engines operated with the crankcase oil temperature over 280 deg. F.

The accelerated corrosion test results indicated that the corrosion of tin-base bearing alloy was negligible with all lubricating oils tested. The corrosion of the lead-base bearing alloys was low and moderate while the corrosion of copper-lead alloys and of the cadmium-base alloys was high. An increase in the test temperatures accelerated the oxidation and the rate of acid

(TURN TO PAGE 102, PLEASE)

MOTOR TROUBLE



that might have been PREVENT

Maybe you have been putting up with unnecessary motor trouble . . . going crazy with red tape trying to replace worn out parts that Frams could have saved. Hundreds of fleet owners have already proved, by actual trial, that Frams cut maintenance troubles, save hard-to-get parts. "Wear found to be 3 and 4 times more on engines not equipped with Frams," writes a West Coast operator. "200,000 miles before reboring," reports a transportation company. "Frams cut engine wear in half," a bus operator writes.

So take a tip from the experience of other fleet owners. If your fleet has no filters, install Frams. Fram Oil & Motor Cleaners have patented, chemically-treated cartridges that filter out dust and abrasives and also impede formation of acids and other harmful corrosives that eat away motor parts.

If your fleet HAS filters, check and be sure they are adequate for today's operating conditions. Step up performance by equipping with genuine, chemically-treated Fram Replacement Cartridges, now made to fit most makes and types of filters. Fram Corporation, Providence, R. I. Canadian Distributor: J. C. Adams Co., Ltd., Toronto, Ont.





FRAM'S GUARANTEE

Put FRAM Oil & Motor Cleaners on your fleet. Operate on regular schedule for 90 days. Then, if you are not convinced that FRAMS save many times their small cost, we will gladly refund your money.



SAE REPORTS

(CONTINUED FROM PAGE 100)

formation of the lubricating oil and the corrosion of the tested bearings. The results of the test indicated that a satisfactory re-refined lubricating oil can be further improved and made low corrosive by mixing it with a suitable additive. The same oil, however, can be made very corrosive by addition of an unsuitable additive.

The conclusions reached in the tests

confirmed fully the high corrosion resistance of tin-base babbitt. Lead-base babbitt containing arsenic and silver were found to possess low corrosive properties. This indicated the practicability of continued metallurgical research for developing tin-substitute bearing materials. The bearings alloys which have a tendency to corrode at high temperatures, should be lubricated with low corrosive oils. Adequate cooling of the lubricating oil, in this case, is of paramount importance, because it will impede the oxidation of the oil, and therefore, diminish bearing corrosion.

COOPERATION OF VEHICLE MANUFACTURERS IN ARMY MAINTENANCE PROGRAM

by Brig. Gen. J. Kirk, Ordnance Department

Although the automotive industry is to be complimented for a remarkable achievement in supplying the armed forces with motorized equipment, the industry's responsibility does not end with the delivery of those vehicles.

Production of the vehicles is only half the job and industry has done that half very well. It is vehicle maintenance, the other half of the job, that is slowing us down, and it is time for industry and the army to work it out together.

The army proposes that standardized methods be prepared by the industry and that manufacturers unite in developing a program so as to eliminate technical differences of opinion over maintenance methods.

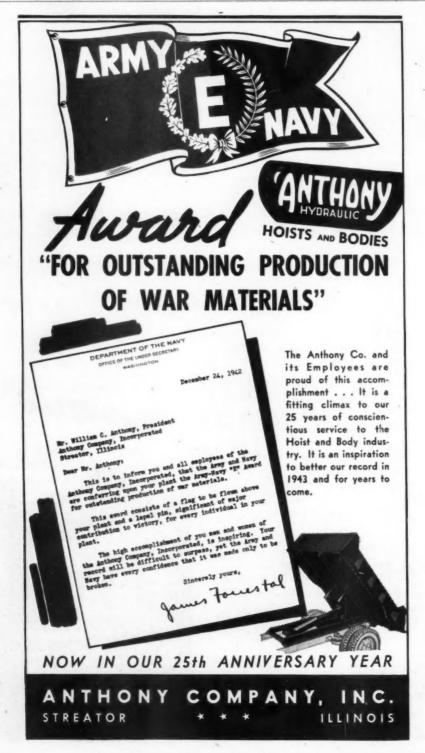
It would seem logical that accurate maintenance instructions should come first from the automotive industry, which should be in a position to better define sound repair procedures and the proper tools to use.

The army, however, does not know which manufacturer's instructions to follow as each one has made his own decisions in his own parts lists and maintenance manuals, but he has made them without evidence of consulting other manufacturers, and without consulting the army. For example, one maintenance manual specifies that the universal joint drive balls should be replaced with new ones, and gives a procedure for doing the job. Another manual, describing the same universal joint, emphasizes that the drive balls should never be replaced but that the whole universal joint should be discarded and a new one substituted.

The army is certainly not in a position to say that one company is right and another is wrong. So who is to make the decision? Who is to say that this repair procedure, parts list, or tool list is not perfect from every angle but is the best workable plan we can develop?

As an example let's take the experience of one soldier mechanic who has the job of repairing the air brakes on two different makes of army vehicles. He reads the maintenance procedure prescribed in the maintenance manual of the first vehicle and proceeds to disassemble and repair its brake system accordingly. The second vehicle is assigned to him to repair, he refers to

(TURN TO PAGE 104, PLEASE)



TRUCK OWNERS Attention!



You can now obtain by Immediate Delivery an Underwriter's Approved Fire Extinguishing Unit

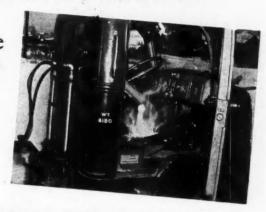
duGas

DRY CHEMICAL

FIRE EXTINGUISHER

Now Available for the Protection

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Automotive
Equipment
Against
Fire
Hazards



This unit complies with the recently amended rule No. 3.3491 (A), Motor Carrier Safety Regulations, Revised, of the I.C.C., and meets the requirement of the Underwriters' Laboratories, Inc., war emergency specification No. 299, dated December, 1942.

ANOTHER OF OUR CONTRIBUTIONS TO THE WAR EFFORT

DUGAS is a dry-powder chemical compound, moisture resistant and free flowing. Extinguishes fire efficiently. **HARMLESS**—to motors, mechanical parts, materials, everything but flame—non-abrasive, non-corrosive, non-boismous.

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NO TOXIC FUMES OR GASES—DuGas on meeting flame generates carbon dioxide and water-vapor gases.

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The DuGas Dry Chemical Fire Extinguishing Unit consists of two tubes, each containing seven pounds of DuGas powder, both contained in a bracket suitable for mounting on trucks.

PRICE OF UNIT . . . \$6.50 F.O.B. MARINETTE, WISCONSIN

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SAE REPORTS

(CONTINUED FROM PAGE 102)

the vehicle's maintenance manual. He notes that the repair procedure for the second vehicle is different from the first one and that the explanation takes only two paragraphs as compared to seven pages for the first vehicle. When he starts to work on the brakes of the second vehicle he is amazed and confused to find that the brake systems on the two vehicles are identical. It is not a question as to which manufacturer's procedure is right or which is wrong,

we want the procedure that will do us the most good and we want it standardized.

There is evidence of inadequate consultation between industry and the army. The army is at fault just as much as industry, but we are not here to place blame. Our task is to correct a situation that can only be corrected by cooperation among all of us.

★ DISCUSSION ★

Colonel T. L. Preble: There is need of creating a standard doctrine for factory

representatives in the field for instructional purposes. The electrical equipment and carburetor manufacturers have cooperated by standardizing their instructional material and their language in referring to maintenance technique. There is need for similar coordination, for instance, among the 17 spark plug company representatives in the field. Field representatives should follow a standard form and use the same technical language so that Army trainees will not be confused. The Automotive Council for War Production, the Wheel and Rim Association, and American Petroleum Institute appear to be logical groups to carry through this work of standardization. He proposes coordinated Army-industry committees that will avoid duplication of effort.

J. M. Crawford, Chevrolet: The designer works within the limits of a manufacturing department. The SAE group is limited to technical assignments. The ACWP appears to be the best group to do the job on maintenance matters. He suggests a working arrangement with the Army to perpetuate this cooperation after the war. George Romney, Managing Director of ACWP: The ACWP already has been doing work along the lines suggested. It is ready to set up the mechanism to carry out

further suggestions.

Colonel B. J. Lemon, U. S. Army: The rubber industry set up cooperative committees to work with the Army as early as the Fall of 1941. Field representatives are assigned to various Ordnance Dept. projects. This coordination was apparent at the Louisiana maneuvers.

Brig. Gen. S. G. Henry, Armored Force School, Fort Knox: Instruction manuals which are the trainee's Bible, should be written so that conflicting statements and mistakes are eliminated. Fort Knox School has had to write its own lesson sheets for new equipment. Plenty of pictures, especially "exploded" view, showing the relation of the part in the assembly, are very desirable in teaching trainees. Much care must be taken in determining the tools needed.

Major Pratt, Tank-Automotive Center: Interchangeability of parts is very desirable. Even in the supposedly standard jeep made by two manufacturers (Ford and Willys) only 50 per cent of the parts are interchangeable. Maintenance manuals should be very simply written, giving a clear step-by-step description of operations. After all, the average soldier has only about a sixth grade education. The manufacturers should do something about air cleaners which are inadequate on 90 per cent of the military vehicles. Standardization of parts, accessories, and unit assemblies is very desirable.

THERE'S A WAR TO WIN

Along with other manufacturers we are engaged in the service of our armed forces. That means Uncle Sam comes first and his wants must be provided for to the best of our ability. This also means that unfortunately we cannot service as adequately as we should like to the Weidenhoff equipment now operating to keep domestic automotive transportation functioning. We realize our obligation to the owners of Weidenhoff equipment everywhere and still will do all in our power to help them get the greatest good out of their investment. For the duration we shall be limited in accomplishing this. Meanwhile we suggest all users of equipment to read the following hints.

All switches of a test bench or other apparatus should be in the OFF position when the equipment is not in use. It provides protection to the meters.

Clean corrosion of any kind from switches with fine sand paper or emery cloth. This applies particularly to switches carrying heavy current.

Be exceedingly careful of voltmeters, ammeters, etc. If they are damaged or broken, replacement of the unit may be impossible.

Take exceptionally good care of test leads. Keep them free from oil and grease. Remember oil and grease affect rubber insulation and test leads for replacement purposes are out for the duration. It's a good plan to wash the leads with soap and water, using a sponge or rag.

Avoid using a vacuum gauge on an engine that is back firing. The interior mechanism of the gauge may be damaged and replacement of the gauge is doubtful.

Don't pull testing equipment around by means of the wire leads attached to it. Also, when a lead is detached grasp it at the terminal.

Be careful of cars passing over rubber hose attached to a gas analyzer. You know what the rubber situation is. And, the hose should not be left lying on the floor where it may contact oil and grease.

If amperage or voltage is to be checked be sure to select a scale high enough so the meter will not be damaged. Overloading the meter may damage the unit and it is doubtful if a new meter can be obtained.

Moisture of any kind is harmful to electrical testing equipment. Therefore, at regular intervals wipe off any trace of moisture and keep the equipment in a dry place.

Test bench motors should be lubricated in accordance with the instructions furnished. This point is easily forgotten since these motors are used intermittently. Keep the motors clean and never allow the brushes to become worn so that the brush holders might damage the commutator.

If dry cells are used in the equipment remove them when they are "dead". Such exhausted cells become corroded and may cause corrosion of adjacent units.

If you have a growler don't leave it turned on after removing the armature on test. The growler will overheat and may burn out.

Finally, remember that your testing equipment will have to do for the duration. Therefore, conserve it in every way possible.

BUY WAR BONDS

Joseph Weidenhoff, Inc.



BUY SAVINGS STAMPS

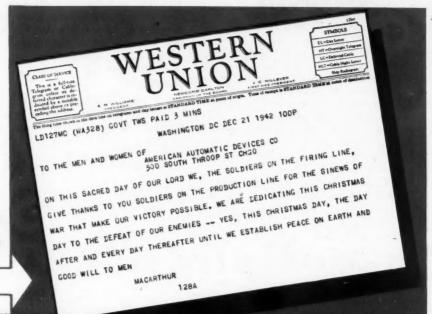
Chicago, Illinois, U.S.A.

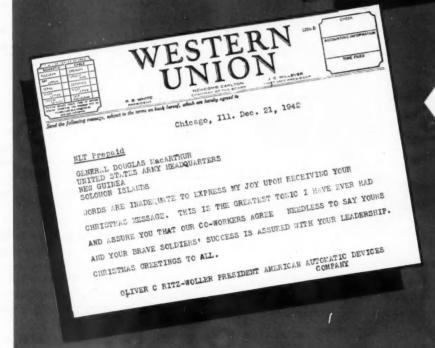
SERVICE CONDITIONS FACED BY MILITARY VEHICLES

by Lt. Col. Joseph M. Colby, Ordnance Department

The essential elements of maintenance are trained men, tools and facilities, and spare parts. The most likely (TURN TO PAGE 106, PLEASE)

THE HERO OF THE PACIFIC





and OUR REPLY

KINGBEE IS SERVING ON ALL FRONTS including THE HOME FRONT















AMERICAN AUTOMATIC DEVICES CO.

Manufacturers of the Famous KING BEE Products

HARRISON, THROOP AND CONGRESS STREETS

CHICAGO, ILL.

SAE REPORTS

(CONTINUED FROM PAGE 104)

to fail is that of spare parts. The many campaigns in Egypt—British, German, or Italians—have failed due to the failure of maintenance.

The failure of maintenance has been due to the lack of provision of spare parts and the failure to provide spare parts has been due to the lack of anticipation of requirements and their timely requisition on supply bases.

In Egypt the tools and facilities problem was most annoying. While complete sets of tools were furnished with vehicles, none were furnished for major disassembly and overhaul. The problem is one of getting the tools to the mechanic and that tools provided be applicable to the mechanism being maintained.

The problem of training men is not difficult, provided there is someone who knows the subject to instruct and supervise the work. In this connection, the importance of clear, simple maintenance and operation manuals cannot be too highly stressed.

The greatest improvement which we

can now make in simplifying the maintenance problems is the simplification of the equipment to be maintained. Thus, it is quite simple in a theater of operations to train men to take care of one engine and to furnish tools to overhaul one engine or to furnish spare parts for one engine, but if this one type of engine is increased to three or four different types of engines, it means that the burden of each of the essential elements of maintenance - that is, trained men, spare parts, tools, and facilities increased in direct proportion to the number of the different items to be maintained. Therefore, you can anticipate a great program leading to a standardization, not only of vehicles, but of components of those vehicles.

END

(Please resume your reading on P. 50)

CHECK AIR LOSS BEFORE INFLATING

(CONTINUED FROM PAGE 50)

cars representative of the average were parked. This was followed up by another survey of 500 other vehicles to obtain a wider cross section. The result of these surveys showed that one out of every three vehicles had one or more tires that was going flat. Obviously, as is reasonable to expect, the same or even greater percentage of leaking tubes were found. In addition, some valves were found to be leaking.

2. Experiments were made to determine how much air was lost by a punctured tire and how long it would run before going flat. The procedure of these experiments was to drive nails through the tire and tube and to put such tires in service until they became flat.

Of 18 such tests, only one had to be terminated after a short time. In this test, a ten-penny (3-in.) nail was used and excessive air loss developed within the first two hours. Using a four-penny (1½-in.) nail, driven through tire and tube, on four wheels of the same vehicle the result was as follows:

1st tire ran over 2300 miles before going flat.

2nd tire ran over 3900 miles before going flat.

3rd tire ran over 5100 miles before going flat.

4th tire had not gone flat after it had been run over 8,480 miles, at which time the test was terminated.

3. The next survey was made with the cooperation of service managers,

(Turn to Page 108, Please)

Take a Tip from CURTIS

Here's the Way to Prolong the Life and

Protect the Service of Your Air Compressors

Protect the Service of Your Air Compressors

Today, as never before, it's important
for you to take the best possible care
for you own service equipment. Your
of your own service equipment and compressed air is an
the duration and compressed air is an
the duration and compressed air is an
important part of proper maintenance.
important part of proper maintenance.
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important part of compressors
important part of compressors.

Tunnal

CHECK INSTALLATION—Compressor should be in clean, dry, level, accessible, and well-ventilated place. Check to see if compressor and motor operate at recommended speed and in right direction. See that specifications of motor and connections agree with current and voltage available.

LUBRICATION — Maintain proper oil level and use recommended grade of oil. Keep oil off belts and other unlubricated parts. Drain and refill crankcase at least every 3 months.

TESTING—If air supply or pressure decreases, test all outlets, joints, and valves for leaks—using soapy water and brush. Periodically inspect check valves, safety valves, or valves in head of compressor. If they leak, remove and clean—oil them so as to work freely.

SERVICING — Drain moisture from air tank at least weekly, preferably every day. When replacing head gasket, secure proper grade of material from manufacturer — do not use paper or soft rubber.

ELECTRICAL — Keep motor dry. Don't connect motor to light wiring — run proper size wiring direct from meter. Disconnect automatic units at night unless in use.

Proper fusing prevents burnt-out motors.

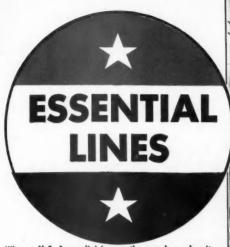
Don't over-fuse. Don't use jumpers. Thermal cutouts are recommended for any motor, but should always be used with 2 or 3 phase motors to prevent single phasing.

KEEP CLEAN — Wipe your compressor unit off at frequent, regular intervals. Set a time each week for this important service.

CURTIS PNEUMATIC MACHINERY DIVISION

of Curtis Manufacturing Company

1970 Kienlen Avenue, St. Louis, Missouri



When a U.S. Army division on the march reaches its destination, the Signal Corps goes into action. Wirelaying trucks spread a network of telephone wires throughout the encampment. Wires connect the general and his staff by telephone to all sections of the division. These wires are essential lines. Likewise.



(Photo Courtesy Chavrolet Motor Co.)

WAGNER LOCKHED HYDRAULIC BRAKE PARTS and FLUID

are essential lines for servicing both army and civilian cars and trucks which must be kept rolling

THE war has placed added importance on the necessity of maintaining brakes so that they will operate economically and effectively at all times. This type of service calls for the use of quality products such as are available through Wagner jobbers.

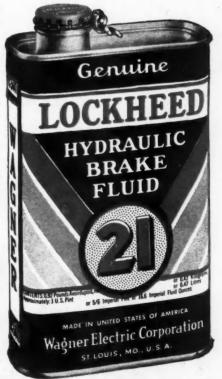
For seventeen years Wagner has been the acknowledged leader in the development and manufacture of Lockheed Hydraulic Brakes, and also in producing the brake fluid which is a vital part of the hydraulic brake system.

The benefits of this valuable experience over this period, plus the convenience of national distribution, are available to you through the jobbers who handle Wagner products...There is a Wagner jobber near you. Look to him for your requirements on Lockheed Hydraulic Brake Parts and Fluid.

No. 21 IS A YEAR-ROUND FLUID for ALL CARS and TRUCKS... No. 21 retains its highly efficient qualities under all driving conditions. It completely and properly mixes with all other approved fluids, furnishes necessary lubrication for working parts of the hydraulic brake system, and in general, preserves the essential characteristics of the entire system.



FOR VICTORY — BUY U.S. WAR BONDS and STAMPS!



H42-

AUTOMOTIVE PARTS DIVISION

Wagner Electric Corporation

SAINT LOUIS, MO. U. S. A.

CHECK AIR LOSS BEFORE INFLATING

(CONTINUED FROM PAGE 106)

engineers and managers of mileage accounts of the largest tire manufacturers. They were informed of the findings to date, and many were in a position to confirm the results of the tests and surveys. One service manager related the experience of one mileage account where 139 vehicles were in daily operation. The records

showed that tire changes at the garage, due to all causes including replacing tires, required demounting every 6000 vehicle miles. Road tire changes were made on an average of 212,000 vehicle miles for all 139 vehicles. In this case, tire pressures were taken before inflation each night.

4. A survey of small tire vulcanizers conducting an exclusive retail business. They were asked the following question: "Are many tires brought to you with tubes mounted

and fully inflated, for the purpose of having the tires recapped?" The answers were "Yes."

Another question was, "When these tires and tube assemblies are brought to you, do you bother testing the inner tube after it has been removed from the casing?" Here, too, answers were "Yes."

The question that followed was, "On these tubes which the motorist heretofore has considered being airtight, do you find a large percentage of actual tube leaks?" The answer in each case was "yes." The general estimate of the average of leaking tubes was approximately 20 per cent. This represents an average of one per vehicle. However, this does not represent the general average, as tires taken to the vulcanizers for recapping are obviously considerably worn and, therefore, more likely to become punctured.

Numerous other general tests and surveys were conducted. Some of these were at gasoline service stations, company employees, etc. One of these was a three-day free tire inspection service conducted under the auspices of the Hempstead, L. I. Chamber of Commerce. Here, the survey indicated that more than 80 per cent of the cars tested had underinflated tires and that approximately one third of the vehicles had one or more tubes losing air. Over 19 per cent had spare tires that were absolutely flat. Over 15 per cent had spare tires carrying 15 lb. pressure, or less. Valve leaks were not counted in arriving at these averages.

All the Schrader tests pointed definitely to one conclusion: a tire maintenance practice that simply kept all tires inflated up to manufacturers' recommendation without determining how much air is required to bring each tire to that point is inadequate. The procedure should be reversed. An accurate pressure reading should be taken before inflation to determine how much air has been lost since last inflated. If the loss is abnormal, the wheel should be demounted and the cause of the excessive air leak found.

At this point fleet operators naturally might raise the question as to what is considered an abnormal air loss and how often these checks should be made. The Schrader tire checking program does not make any recommendations out of the ordinary

(TURN TO PAGE 110, PLEASE)



ONE LOOK AT THIS DELUXE CARTRIDGE

TELLS YOU NEGLECT IS abotaging AN ENGINE!

By simply looking at a used DeLuxe cartridge, a DeLuxe Engineer can diagnose what is going on inside the engine!

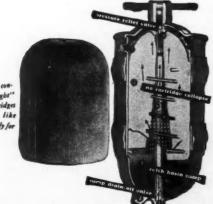
For example, inspection of this cartridge told DeLuxe engineers that the chief trouble-maker in this engine was-Neglect!

Deposits of sludge indicate that this cartridge has been used too long.* During the period of use recommended for a DeLuxe cartridge, sludge is not only kept out of the oil, but actually prevented from forming! The DeLuxe filter, due to exclusive construction features, cleanses the oil of asphaltenes before they can unite with other substances to form sludge.

The conditions inside your engines deserve closest attention in these times when it is so vital to keep transport rolling and conserve oil. To meet this situation, requests for analyzation of cartridges by fleet, bus and truck operators will be handled by DeLuxe Field Engineers as quickly as the volume of requests permits.

* Or used on an engine in which sludge is present due to previous neglect in changing cartridges; or through previous non-use of an oil filter; or use of a less efficient type oil filter.





SEND FOR THE "FILTER FACTS" BOOKLET containing basic facts on engine lubrication, and causes and cure for oil contamination.

Read why DeLuxe's "maintained cartridge density" and seven other construction features are all essential to complete and continuous oil cleansing. DeLuxe Products Corporation, 1406 Lake Street, La Porte, Ind. In Canada, 364 Richmond St. Toronto.

LEAN

CHECK AIR LOSS BEFORE INFLATING

(CONTINUED FROM PAGE 108)

in this respect. Recommended minimum is weekly. Many fleet operators check tires daily. Fleet operations covering much mileage in a day's run naturally should check tires oftener than fleets having low daily mileage. Road conditions, too, are another variable which individual operations should take into consideration. Littered streets, broken paving, etc., are hard on tires.

Variation in pressure is another point that is relative, depending upon the fleet operation but mostly upon the interval between pressure checks. A two-pound variation in an operation where tires are checked weekly could be considered normal, whereas a two-pound variation in pressure of tires that are checked daily might be considered a warning signal.

The Schrader organization developed an interesting tire pressure record form, illustrated in Fig. 1, which will enable the tire man to determine bevond a shadow of doubt if a varia-

tion exists in the tires on a given vehicle and just how great the variation There is nothing complicated about this form and it is possible to carry on the program without it, but it certainly is a worth while aid in making it unnecessary for the mechanic to remember pressure readings taken, especially on the larger vehicles having many tires.

A study of Fig. 1 will show that the object of this record is to note the pressure before inflating. The pressure reading for each tire should be written in the respective column. It should be made clear to the mechanic that he is to show the initial pressure and not the final pressure. After all readings are taken, a glance along the line not only will show any variations for the day but also how that variation compares with the previous checking. The figures encircled in the illustration indicate warnings that should result in either of the two checks outlined in the beginning of this article namely, valve check or tube check.

The Schrader Tire Inflation program, in its entirety, is as follows:

1. Check tire pressures regularly before inflation, making a careful comparison of the pressures of all tires. Slight variations will occur. but wide variations are abnormal.

2. Re-inflate lost air pressure at least each week. Always include the spare tire.

3. Inflate tires when cool. Tire pressures increase due to flexing and road friction, even in cold weather. If impossible to follow this practice, learn how much your tire pressures increase between your starting point and the inflation station and add that much extra pressure when inflating to compensate for the increase.

4. Be sure that gaging equipment being used is accurate.

5. Apply sealing tire valve caps to prevent any loss of air at the mouth of the valve.

EDITOR'S NOTE: Copies of the Tire Pressure Record illustrated in Fig. 1, for keeping the recommended air loss record, are available free of cost. COMMERCIAL CAR JOURNAL readers are entitled to one card for each vehicle in the fleet. The size is 5½ x 9¼ in. and it is printed on good, tough card stock. To get your supply, simply write "Schrader" and the number of cards required in the margin of the free postcard between pages 42 and 43 of this issue and mail it promptly.

(Please resume your reading on P. 53)



Thanks to Amazing New DSC*Principle

Tires that heat up rapidly - due to excessive flexing — are not only expensive to operate but are, in many cases, unsafe to drive.

It takes cool-running Cooper tires

with famous Distributed Stress Construction to eliminate hazards of excessive tire heat give you top performance required by today's greater demand on trucks for movement of essential freight. And give you top performance at new low maintenance costs. Cooper Distributed Stress Construction uniformly dis-

tributes tire strain, bead to bead. At no point is there excessive flexing. Thus Coopers, built to reduce friction and heat, are also better balanced for greater strength.

Cooper DSC truck tires actually run 20-30° cooler than ordinary tires.

Your Cooper dealer will be glad to interpret these figures into real tire savings for you. Look him up today. No obligation.



Rapid flexing of wire at one point causes heat and break. When flexing

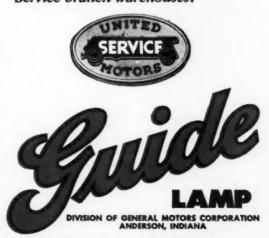
The Cooper Corporation Dept. C-2, Findley, Ohio





In every detail of design and construction, Guide Sealed Beam units reflect the "know-how" that makes a product dependable. You can spot it in the sturdy way they are built—in the quality and accuracy of the reflecting surface and lens—and in the correct focusing that stays correct for the life of the unit. Guide has been building safe lighting equipment for cars and trucks since the early days of the industry. Guide Sealed Beam units are worthy guardians of fleet safety.

Guide products and service parts are sold through independent United Motors distributors served by 20 conveniently located United Motors Service branch warehouses.



WORLD'S LARGEST MANUFACTURER OF AUTOMOTIVE LIGHTING EQUIPMENT

EASTMAN ADMITS 21'S FAULTS

(CONTINUED FROM PAGE 29)

and farm operations are essential both to the civilian economy and the war effort. There is a lot of saving that can be made in farm operations; not so much, perhaps, as can be made in certain other fields because the farmers do not use their trucks so intensively. But there are savings that can be made and I

think if you had seen the instructions that we worked out with the Agriculture Department and which have gone to these county farm transportation committees, you would see that there is every endeavor to bring to the attention of the farmer and to enforce the need for those savings in mileage.

"Another thing that we have done was to temporarily—we couldn't do it permanently—push out our field offices, send examiners out into the field and convert 142 offices into

about 600 and in that way bring our field force closer to the smaller operators in this process of revision and make them more accessible.

"We realize there are important groups with very special problems in connection with the matter of conservation and that applies both to the private operators and to the for-hire operators. Boiling the thing down, there are really two important things:

"First, to eliminate waste in service, that is where the public is getting more service than is essential.

"Second, having determined the amount of service, to eliminate waste in operation in providing that service.

"There is a third possible phase upon which we have worked inconclusively so far and that is coordination between rail and truck operations, which means using both of them in the places where they can be used to the greatest advantage under present conditions.

When it comes to the groups which are deserving of special consideration, Mr. Eastman made reference to the field of local deliveries: milk collection and delivery, coal deliveries, bakery goods, parcel deliveries, newspapers, and so on. Here will be required, he said, the working out of the utmost conservation cooperation between the operators: pooling and often agreements which in normal times would be violative of the anti-trust law but which, if his office orders to be put into effect for war purposes, the Department of Justice will sanction and, in many cases, already has sanctioned.

"It is perfectly clear," he asserted, "that we have got to have help from the industries in regard to these matters in working them out. The opportunities for doing these things are myriad. My staff cannot possibly work out the details of each and every order to accomplish pooling or cooperation of the kind I am talking about in each one of these myriad situations throughout the country and then impose that by order.

"We can help, lead, prompt, work out the general principles and we can improve what you have done and give it the sanction of an order which will clear it with the Department of Justice when it is accomplished. But

(TURN TO PAGE 114, PLEASE)



Do you use a gauge just to find out whether your tires are carrying the recommended pressure? If so, you are overlooking an important use of the gauge... that is, to detect excessive pressure loss and thus help prevent flat tires.

FOUR STEPS HELP PREVENT FLATS

First, keep air-tight caps screwed down tight on all tire valves. Then you know the valves can't leak.

Third, if necessary, re-inflate tires to recommended pressure.

Fourth, compare the recorded tire pressures of all tires on each vehicle.

Second, check the exact amount of air pressure in each tire with an accurate gauge and record the pressure. (Use a separate record card* for each vehicle.)

Fourth, compare the recorded tire pressures of all tires on each vehicle. If one tire has apparently lost more air than its mates something is wrong; you may have a puncture. Have the tube checked immediately before underinflation damages the tire.

*To start this plan now, operators of fleets of vehicles can get a supply of commercial Tire Pressure Record cards, no charge, by writing to Schrader.





COMPARATIVE AIR LOSS TEST

THE Schrader SYSTEM OF FLAT TIRE PREVENTION

A. SCHRADER'S SON, Division of Scovill Manufacturing Company, Incorporated, BROOKLYN, N.Y.

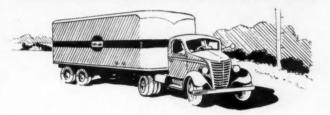
CONTROL SUPERIOR STEEL IS DOING BETTER FOR WAR TODAY * IT WILL DO BETTER FOR YOU TOMORROW ** ** **

If you are a builder of truck and trailer bodies, a sign maker, or a manufacturer of sheet metal products requiring durable finishes, you probably hold in fond memory a certain steel sheet which combined many advantages found in no other material. This sheet worked well, shaped well, and carried a special heattreated zinc coating that not only held paints and fine finishes, but also provided protection against rust.

That was SUPERIOR GALVANNEALED in peacetime. Now, this quality sheet is needed to build war machines. After the war is over, there will be SUPERIOR GALVANNEALED for all its former uses and perhaps for many new applications. It will continue to be the quality sheet for truck and trailerbody construction.

THE SUPERIOR SHEET STEEL CO., CANTON, OHIO
(Division of Continental Steel Corp., U.S.A.)











CONTINEIOR STEEL CORPORATION

EASTMAN ADMITS 21'S FAULTS

(CONTINUED FROM PAGE 112)

we have got to have your help in working it out.

"In that connection, we are adding to our staff men who can help us work on individual industry problems.

"We have got the same sort of thing to do with the common carriers because of the many opportunities for pooling, interchanging of equipment and that sort of thing which will lead to more efficient, economical operation as far as they are concerned."

Director Eastman declared that if a 40 per cent saving in mileage could be accomplished it would insure continued operation of all classes of motor trucks. If vehicles, parts and rubber were not conserved, he said, serious shortages would develop and then priorities would have to be applied. Mr. Eastman does not relish the task of classifying truck operations for priority purposes. Said he:

"You have got to determine the rank of various operations in the scale of essentiality so far as the war effort is concerned and supply first those that come first in that list; those that come last will have to take what is left. I very much hope that in all of this transportation business we can keep away from priorities.

"Let me emphasize that the work we are doing is temporary work, work caused by the war and it is work for the purpose of getting maximum utilization of the transportation facilities of the country for the successful prosecution of the war. After the need for it is over, the greatest hope I think of everybody on the staff of the Office of Defense Transportation is that it will go out of existence as soon as possible. We have no desire to perpetuate it and I expect to see the Interstate Commerce Commission, which has been going on for 50 years, continue to go on, and the Office of Defense Transportation go on to the switch as soon as the need for it ceases.

"All that we are trying to do is to get the utmost possible use that we can out of all these vehicles and to keep as many of them rolling and moving efficiently as we possibly can so long as the war continues."

END

(Please resume your reading on P. 30)

Lempco Wins Army-Navy "E" Award

The joint Army and Navy "E" was presented to Lempco Products, Inc., Bedford, Ohio, for excellence in production of war materials under contract.

Street Traffic Control Experts Recommend Wartime Changes

Six ways to speed up traffic under wartime conditions, thereby saving rubber and fuel, were discussed at a conference of street traffic experts called by Joseph B. Eastman, ODT Director.

The conference agreed that failure to adjust street traffic controls in line with changed conditions has created a needless waste of time, gasoline and rubber. It further agreed to make specific recommendations to the ODT on the following subjects:

- 1. Elimination of unnecessary traffic signals.
 - 2. Improvement in signal timing.
 - Improvement in signal coordinations.
 Non-use of signals in off-peak hours.
- 5. The function of the traffic officer on fixed post.
- 6. Establishment of war transportation routes.



Faster schedules . . . heavier loads . . . lowered top speeds . . . but still on time. Harder driving is required to take advantage of every opening.

It takes better brakes to insure safety for that kind of driving. The answer is Grafild Linings first step towards absolute brake control.





YOUR ENGINES?

If you can, you've gone far in solving the most important part of Preventive Maintenance. And if you can't, you can find the right answer now in National SAVIT Service.

National SAVIT Service includes thorough cleaning and freeing of piston rings, pins and valves—in fact all moving parts. It also cleans all oil lines, protects bearings and removes foreign substances from the crankcase.

Write today for free samples of National Periodic Inspection Service forms . . . and with them the complete story of National SAVIT Service.



NATIONAL EN-AR-CO MOTOR OILS and LUBRICANTS
NATIONAL WHITE ROSE GASOLINE

THE NATIONAL REFINING COMPANY • CLEVELAND, OHIO Cleveland • Indianapolis • Chicago • Peoria • Omaha • Kansas City • Memphis East of Ohio . . . The Globe Refining Company, Cleveland, Ohio

ODT NEWS

(CONTINUED FROM PAGE 54)

vided, That each such certificate pertaining to a vehicle exempted hereby shall be kept available for inspection at the office or other place of business of the owner or operator of said vehicle at which are customarily kept the transportation records pertaining to the operation of said vehicle. Effective Jan. 13, 1943, until further order.

Garages Urged to Favor Trucks

John L. Rogers, Director of the Division of Motor Transport, ODT, called upon

garages and automotive servicing establishments to "ration their facilities and mechanics' time and to give precedence to essential transport units." In an appeal made before the Junior Traffic Club in Chicago, he said,

"The vital parts and materials situation has grown steadily worse until today an unusually large amount of truck time is being lost. In some cases vehicles are laid up for weeks because of scarcity of needed replacement parts.

"I can assure you the maintenance of our highway transport equipment is one of the most important problems confronting the Division of Motor Transport today. Our trucks, buses and passenger cars cannot be replaced until after the war. To assure needed highway transport, every essential vehicle must be maintained, repaired and kept in service.

"Exact figures are not available but we do know that more than 150,000 automotive dealers, independent garages, tire dealers and oil company service stations are cooperating as Official Stations in this work which might well be termed 'selling' proper maintenance to America's truck owners. More than 2,000,000 trucks now display the U. S. Truck Conservation Corps insignia indicating that their owners have pledged to practice preventive maintenance of their vehicles and tires. To you, as shippers or representatives of shippers, it is of vital importance that our existing automotive vehicles be taken care of and made to last throughout the war. I earnestly solicit your assistance in this program. Whenever you contact an owner of an essential vehicle, bring this need for proper maintenance to his attention."



Joseph B. Eastman announced establishment, within the Office of Defense Transportation, of a Division of Material and Equipment Requirements, replacing the Section of Materials and Equipment.

The new division will perform functions developing upon ODT in connection with its designation as the claimant agency for domestic transportation under the Controlled Materials Plan of the War Production Board.

Warren W. Kelly, who has been director of the replaced section, is Director of the new division. August L. Sorensen is associate director. Carroll W. Brown is assistant director.

Mr. Kelly was general purchasing agent of the Atchison, Topeka & Santa Fe Railway. Mr. Sorensen comes from the Association of American Railroads. Mr. Brown was on the staff of the Federal Coordinator of Transportation from 1933 to 1936.

Mr. Eastman summarized the functions of the division as follows:

1. To gather from other divisions of ODT, and other sources, estimates of the requirements of domestic transportation for materials and equipment.

2. To compile these estimates into an over-all integrated domestic transportation requirements program for his approval.

3. To prepare the approved program for presentation to WPB.

4. To arrange, with the advice of other ODT divisions, proper allocations of materials and equipment in accordance with WPB's determination and allotment of the program's requirements.

New ODT Appointments

Raymond Skinner, of Memphis, Tenn., and Frank G. Reed, of Chicago, Ill., were appointed members of the staff in the Local Delivery Section of the Division of Motor Transport, Office of Defense Transportation.

END

(Please resume your reading on P. 56)







Eliminate Your Bottleneck in Production and Service Departments with This Completely Universal Hose Clamp

ONE LENGTH ALL-SIZE REPLACES 100 PREFORMED CLAMP SIZES

Costs Less — Easier To Use — 100% Self-Locking. Comes Flat In Any Desired Length To Accommodate Any Range of Diameter Sizes.

If you use preformed clamps for hose or general connections, learn how the powerful, completely universal ALL-SIZE CLAMP can save time, labor and money for you!

Popular for many years in the automotive industry, the ALL-SIZE today also is serving many unusual wartime production and replacement needs. It has been tested and proved ideal for all hose and general connections.

A single length ALL-SIZE CLAMP will replace more than a hundred different sizes of preformed clamps—reducing your clamp inventory—and assuring the right size clamp on hand when needed!

It is made of extra heavy rolled steel; can't slip, strip, twist or loosen. Available for Immediate Delivery. Has sufficient take-up for use on synthetic rubber hose, and can be installed around, or removed from, connected lines. It also is usable over and over again on either larger or smaller sizes.

Every user acknowledges the ALL-SIZE to be superior to the strongest clamps made. It is 100% self-locking and easier to use ... Costs less, too!

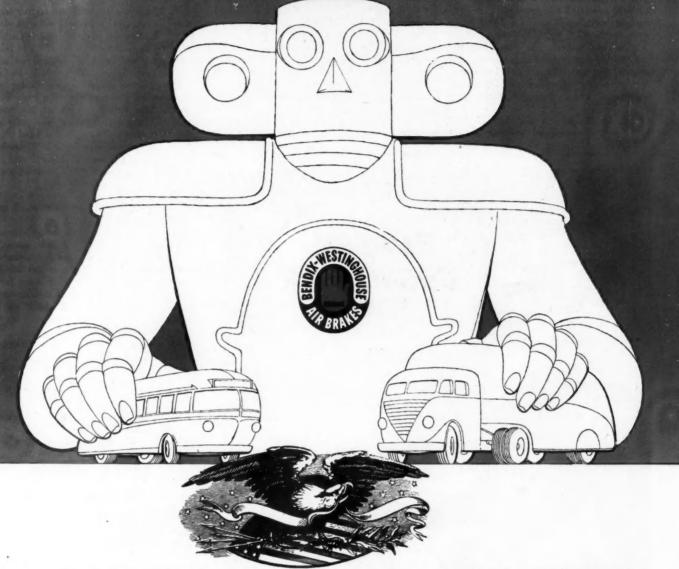
Send TODAY For FREE Samples and Prices



1018 SO. WABASH AVENUE

CHICAGO, ILLINOIS

AMERICAN INGENUITY



... MAKING BIG ONES OUT OF LITTLE ONES

Bendix-Westinghouse is proud to continue to serve an industry whose multiplying problems merely spur incentive * So it is, when the Transportation Industry found itself unable to procure the heavy duty chassis formerly employed, an old order was reversed. Thus, today we find them "Making Big Ones out of Little Ones." Elongated chassis, special gear ratios take care of carrying capacity and power and genuine Bendix-Westinghouse Air Brakes traditionally answer the control problem * Not content with this, inspired operators everywhere have taken advantage of

the modernizing potentialities in genuine Bendix-Westinghouse Air Brakes in rehabilitating units which might otherwise have slipped quietly from service * As long as American Ingenuity, genuine Bendix-Westinghouse Air Brakes and Air Control Devices can team as they have in these days of tribulation, you have every right to expect the great things transportation has in store for you when the current strife has been concluded * Your authorized Bendix-Westinghouse Distributor is the headquarters for every control problem . . . Consult him regularly.

BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE CO.

ELYRIA, OHIO

AN ORGANIZATION WHOSE UNDIVIDED EFFORT AND COMPLETE RESOURCES

ARE DEVOTED TO YOUR CONVENIENCE AND SAFETY

QUIZ ANSWERS

(Questions on Page 68)

1. a. Acetylene. Water added to calcium carbide generated the acetylene gas on the earliest models. Later, acetone cylinders were employed.

2. c. 1940 models. The development of the "Sealed Beam" headlamp was a cooperative project undertaken jointly by the automobile industry, lamp and headlight manufacturers, and various highway safety

3. a. Dr. Diesel, in the fall of 1913, boarded a cross-channel steamer at Ant-

werp, bound for London. When the ship docked Dr. Diesel with all his papers was missing. Was it suicide? Murder? Accident? The mystery has never been solved.

4. b. Thick, small windows of quartz glass have permitted observations that disclosed many secrets of fuel combustion and led to many new developments. High-speed cameras, capable of taking pictures at the rate of 5000 per second have been used to photograph the action within the chamber through such windows.

5. b. It was the Merritt brothers, who while prospecting for gold, stumbled into the great Mesabi Range in the Duluth-Superior region. The iron ore from these deposits assays 64 per cent pure iron and

is the source of most of the iron and steel used in the United States. Considering that more than eighty per cent of the weight of a truck is iron or steel in some form or other, we can realize the importance of the discovery.

6. The first successful self-starter was a direct result of a broken jaw. In 1910. Henry Leland was president of the Cadillac Motor Car Co. A Mr. Carter, close friend of Leland, had suffered a broken jaw when the engine kicked back while he was cranking a car on Belle Isle Bridge over the Detroit River. This later caused his death. The sudden death of his friend spurred Leland in a search for some system to eliminate the dangerous hand crank. Leland brought his problem to Charles F. Kettering, and it was "Boss Ket" who contributed the self-starter to the development of the modern motor vehicle.

7. b. The first oil well, driven in 1859 by Col. Edwin L. Drake, struck oil at a

denth of 69 feet

8. d. This method is used to determine the center of gravity of a new model. If the center of gravity is too high, the car will roll over easily. If it is too far forward, steering is difficult. If it is too far to the rear, there is difficulty in making turns.

9. b. The ocean. A plant built on the Atlantic Coast now has a capacity of several million pounds per month.

10. first. a. Introduction of electric generator (1909).

second. b. Vacuum fuel tanks first appeared (1914).

third. e. Balloon tires introduced (1922).

fourth. d. Oil filters introduced (1924).

fifth. c. Safety glass introduced (1926).

Night Traffic Deaths Increasing

In spite of what appears to be a gratifying reduction in all types of motor vehicle deaths, an analysis by the Street and Highway Lighting Safety Bureau, New York City, reveals that after-dark fatalities are rising in relation to daylight deaths, and particularly in relation to the amount of travel.



This self-propelled tank destroyer, photo-graphed after the occupation of Algeria, dis-plays a decalcomania American flag for iden-tification. Technicians of The Meyercord Co., African front.



Indiana Harbor Works · · · · East Chicago, Indiana



Everything you want to know about assembling or disassembling a Fuller Transmission is covered step by step and completely illustrated in this new book: "Mechanic's and Driver's Handbook."

Conveniently thumb indexed so you can turn to the section you need without stopping to look it up on a "contents page." Pocket size. No sales talk—no advertising. Just the facts you want to know. Truck service men and mechanics who are entrusted with the maintenance of Fuller Transmissions are invited to order their FREE copy from our Service Department.



NEW PRODUCTS

(CONTINUED FROM PAGE 43)

P83. Exhaust Gas Expeller

Fleet operators will be interested in a device for which the following claims are made: fuel economy, tire saving, smoother engine performance, better idling performance, clean combustion chambers, reduced detonation. This device is known as the DeLuxe Clear-Ex, and is manufactured by Deluxe Products Corporation, La Porte, Ind.

It is a simple automatic air valve which introduces air into the exhaust system. Attached to the exhaust manifold, it is designed to clear the burnt gases remaining in the combustion chambers after the exhaust stroke, and to replace those gases with fresh air which facilitates the complete burning of carbon monoxide gas and dilutes the carbon dioxide gas which, otherwise, would be trapped in the combustion chambers at the start of the intake stroke. DeLuxe Clear-Ex is easily installed and does not require adjustment or attention.

Use free post card for more details

P84. Metal Spraying Fuse Bond

Metallizing Engineering Co., Inc., announces the new Fuse-Bond Process, and equipment for its application, whereby machine components and similar metal parts



now may be prepared for metallizing electrically. Main advantage of the process is that it affords an adequate bond on the hardest surfaces, heretofore impossible or impractical to prepare by blasting or rough threading. It also simplifies preparation of narrow edges, flat areas, and cylindrical parts having keyways, and other interruptions in their surfaces.

Application of the process is with the Metco Fuse-Bond unit. Operating on any 110 or 220 volt, single-phase power line, this equipment fuses a rough deposit of electrode metal into the surface to be metallized. Electrodes are applied to the work with a special holder which uses up to six electrodes at a time, depending on the size and nature of the part to be prepared. Small parts may be prepared with this equipment as easily as large shafts, since there is no excessive heating of the base metal, or disturbing of its physical characteristics.

The Fuse-Bond Unit is compact, being contained in a cabinet measuring only 24 in. high. Weight complete is but 170 lbs. All cables and attachments fit into a bin in the top of the cabinet. Mounted on casters, it can be wheeled right to the job with ease. A complete Instruction Manual provides all operating data. The manufacturer states that unskilled labor can operate the unit efficiently within an hour or so.

Use free post card for more details

P85. Floor Masking Compound

To speed up the job of removing accumlated spillage and overspray from paint room floors, Turco Products, Inc., of Los Angeles and Chicago, has developed a new floor masking material, called Turco Duramask.

This white, thick liquid looks and is handled much like paint. It can be ap(TURN TO PAGE 122, PLEASE)





but GOOD OIL will make her LAST LONGER!

LABORATORY CONTROL SERVICE A Specific Aid

This special service-previously maintained only for "trouble-shooting" to correct excessively high operating costs and reduce down-time-is now expanded.

Wolf's Head engineers analyze oil after its use in your units, and make specific recommendations for reducing operating costs and prolonging engine life in YOUR fleet. This valuable service costs you nothing-write and ask how to get it.

These days, when normal replacement schedules have become "scraps of paper," equipment needs better care than ever before.

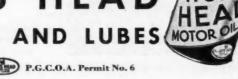
Careful driving and careful maintenance work are absolute musts. And you simply can't be too careful about choosing and using anything as important as oil.

Maintenance records set by Wolf's Head users in pre-Pearl Harbor days, tell a story that no fleet operator can overlook today. They show how, with Wolf's Head, you can effectively prolong engine life . . . and save money while you're doing it.

This is no time to be complacent about oil and lubes. Find out what Wolf's Head has to offer TODAY as the result of over 60 years' experience in refining Pennsylvania crude. Write to Wolf's Head Oil Refining Co., Oil City, Pa., or New York, N. Y.

WOLF'S HEAD MOTOR OIL AND LUBES MOTO





NEW PRODUCTS

(CONTINUED FROM PAGE 120)

plied to the floor with a kalsomine brush. It quickly dries to a hard, durable, nonskid surface which cannot be injured by ordinary foot or truck traffic. When the accumulation of paint on the protective coating is so great as to require its removal, Turco Duramask can be dissolved with water and the paint film can be mopped away, obviating the need of scraping, with solvents or with the conventional alkaline stripping solutions.

Turco Duramask also can be used to protect machinery, walls, work benches and other surfaces from paint, oil or grease spillage. It is an excellent protective floor covering for garages, grease racks and machine shops. Lubricating oil, grease and machining oil are caught on the coating and prevented from seeping into the porous cement or wood floors. At intervals the spillage can be removed simply by mopping off with water. Turco Duramask is noncorrosive, noninflammable and is not injurious to the skin.

Use free post card for more details

P86. Brake Spring Pliers

A universal type of spring pliers is being manufactured and marketed by the New Britain Machine Co., New Britain, Conn.



It will handle most of the brakes on the market, including Ford and other passenger cars. It is cadmium plated and equipped with notched ends to handle adjustments as well as pull cotter pins.

Use free post card for more details

P87. Plastic Spray Gun Bodies

After many months of development and tests, the Eclipse Air Brush Company, 400 Park Avenue, Newark, N. J., presents its spray guns with plastic bodies. The new



black plastic gun weighs a quarter of a pound less than the same gun with an aluminum body.

The plastic body material has good chemical resistance and is not affected by thinners, solvents, paint removers, etc.; it is strong, having good impact strength. The smooth black surface is easy to clean and makes a good appearance. These guns have been on the job for several months in places where equipment of this type is in constant use under strenuous conditions: shipyards, aircraft factories, munition plants, etc. Priority assistance is still required to obtain the guns, but delivery is good.

Use free post card for more details

P88. Puncture Sealing Compound

A new type of puncture sealing compound is being marketed by Ivano, Inc., Chicago, Ill., claimed not to contain sodium chloride or any other ingredients injurious to rubber or valve fittings. The manufacturer states that one treatment will prove effective for years in all temperatures.

This product is introduced into the tubes and, when a puncture occurs, provides a seal as the truck is being driven.

Use free post card for more details

(Please resume your reading on P. 44)







Locate the Causes by Making a "Tracer-Wheel" Check-up!

Of all the misalignments that are hastening truck tires to the scrap heap at the rate of 35,000 per day, none exacts such a heavy toll as hidden chassis defects which cause faulty wheel-roll.

If, because of some mechanical defect, the wheels are thrown out of parallel to the straight-ahead course of the vehicle, nothing in the world can prevent the tires from being dragged and scuffed to pieces. No matter how perfectly the wheels may be adjusted as to camber, caster and measured toein, the destruction of the tires goes

How to detect quickly the hidden chassis defects which spell premature death to tires is the problem of the

hour! Fortunately, however, the solution is already at hand! The Micro-Linor, by means of its patented "Tracer-Wheel" which runs alongside of each wheel as it is being tested, puts a finger on chassis defects with an accuracy that is almost unbelievable.

With the tire supply fast dwindling down to nothing, the only way that you can protect yourself against a still further reduction in travel is by keeping your present tires off the scrap heap as long as possible. The Micro-Linor, you will find, is a most valuable aid in this direction.

Micro-Linor Set No. TML-220 fits truck, bus, and passenger car wheels with 24" to 48" tires-also road graders.

TESTING APPARATUS, INC. 1629 W. Fort





Patented "Tracer-Wheel" Principle



Tire Wear Starts!

Meehanite Foundries

Allentown, Pa.
Traylor Engineering Company

Ansonia, Conn.
Farrel-Birmingham Co., Inc.

Bridgewater, Mass.
The Henry Perkins Co.

Brooklyn, New York E. W. Bliss Company

Buffale, N. Y.
Pohlman Foundry Co., Inc.

Charleston, W. Va. Kanawha Manufacturing Co.

Chattanooga, Tenn. Ross-Meehan Foundries

Chicago, III. Greenlee Foundry Company

Cincinnati, Ohio
Cincinnati Grinders Incorporated
The Cincinnati Milling Machine Co.

Cleveland, Ohio
Fulton Foundry & Machine Co.

Denver, Colo.
The Stearns-Roger Mig. Co.

Detroit, Mich. Atlas Foundry Co.

Plint, Mich.
General Foundry & Mfg. Company

Hamilton, Ohio
The Hamilton Foundry & Machine Co.

Hamilton, Ontario, Canada Otis-Fensom Elevator Company

Irvington, N. J. Barnett Foundry & Machine Co.

Jeannette, Pa. Elliott Company

Lewisburg, Tenn.
Marshall Stove Company

Los Angeles, Calif. Kinney Iron Works

Milwoukee, Wis.
Koehring Company

Mt. Vernon, O., Grove City, Pa. Cooper-Bessemer Corporation

New York, N. Y.
The American Brake Shoe
& Foundry Co.

Ockland, Colif.
Vulcan Foundry Company

Orillia, Canada E. Long, Ltd.

Philadelphia, Pa.
H. W. Butterworth & Sons Co.
Florence Pipe Foundry & Machine Co.,
(R. D. Wood Company, Selling Agents)

Phillipsburg, N. J. Warren Foundry & Pipe Corp.

Pittsburgh, Pa.
Meehanite Metal Corporation
Rosedale Foundry & Machine Co.

Rochester, N. Y.

American Laundry Machinery Co.

St. Louis, Mo. Banner Iron Works

St. Paul, Minn. Valley Iron Works

London, Eng.
The International Mechanite
Metal Co., Ltd.

Weterloo, N. S. W.

Australian Meehanite Metal Co., Ltd.

Johannesburg, South Africa Mechanite Metal Co. (S.A.) (Pty.) Ltd. setter braking better braking better braking line brake drums are made of-

A unique combination of "built-in" physical properties gives Meehanite brake drums longer life, greater effectiveness. Illustrated here is a special design used on Fruehauf trailers.

Today, the inherent qualities of Meehanite brake drums are the very advantages most sought-for by operators everywhere. Long life, smooth sure action, freedom from maintenance, dependability are "musts" today—and because of the special metallurgical structure of Meehanite brake drum metal these qualities are assured: longer life of lining and drums, greater resistance to braking heat, smooth braking action, ample strength to withstand

high pressures, rigidity to prevent distortion, toughness to resist wear.

Proved by hundreds of thousands of miles in commercial service, Meehanite brake drums will help you maintain highest efficiency, reduce maintenance "time-out", provide better braking at all times—in other words, help you "keep 'em rolling"!

MEEHANITE RESEARCH INSTITUTE, 311 Ross St., Pittsburgh, Pa.



JOINT INFORMATION OFFIC

Location, address, management and service charges (in all available cases) of 59 offices approved by ODT as of Jan. 22, 1942. This listing will be kept up to date in future issues.

AMARILLO, TEXAS—200 North Fillmore St. Manager: Mrs. Lucille D. Gilley. Service charges: Clearance statement, 25c; assignment of traffic—one to 100 miles, \$1; 101 to 300 miles, \$2; over 300

ATLANTA, GA.-510 Chamber of Commerce Bldg. ATLANTA, GA.—510 Chamber of Commerce Bldg. Manager: Roy J. Bowden. Service charges: Charge for clearance or assignment of traffic or vehicles is based on number of trucks operated, as follows: 1 to 10 trucks—\$5 monthly; 10 to 20 trucks—\$7.50 monthly; 20 to 30 trucks—\$12.50 monthly; 30 to 50 trucks—\$15 monthly. Non-contributing or non-sustaining common carriers to pay for traffic diverted to them by or through the J. I. O. at 10c per 100 lbe. 100 lbs.

BALTIMORE, MD.-Room 507-22 Light St. Man-

BALTIMUKE, MD.—ROOM 507—22 Light St. Manager: Walter Kneip. Service charges: \$1.

BENTON HARBOR, MICH.—169 Michigan St. Manager: Robert C. Stahl. Service charges: Clearance statement, 50c; Assignment of traffic, partial or full load—up to 199 miles, \$1; 101 to 300 miles, \$2;

toan—up to 199 miles, \$1; 101 to 300 miles, \$2; over 300 miles, \$3.

BIRMINGHAM, ALA.—Comer Bldg. Manager: Sid B. Jones. Service charges: Clearance statement, \$1.

\$2 to carrier utilizing or furnishing equipment 1 to 100 miles; \$4 for 101 to 300 miles; \$6 over 300

BUFFALO, N. Y .- 275 Fuhrman Blvd.

William A. Mackay. Service charges: \$1 each.
CANTON, OHIO—409 Commercial Bidg., 205 Market St. South. Manager: A. R. McConnell. Service
charges: Clearance statement, \$1; Assignment of

CHARLOTTE, N. C .- 1723 N. Tryon St. W. D. Wilkinson. Service charges: Clearance statement, \$1; Assignment of traffic. 5c per 100

statement, 31; Assignment of trame, 5c per 100 lbs.; Minimum, \$1. CHICAGO, ILL.—10 North Clark St. Earl Girard, chairman, Board of Governors. Service charges: Clearance statement, 25c. Assignment of traffic—1 to 100 miles, \$1; 101 to 300 miles, \$2; over 300

CINCINNATI, OHIO—3129 Spring Grove Ave.

Manager: C. T. O'Donnell. Service charges: Clearance statement, 50c. Assignment of traffic—full
truck, \$1; less than full truck, 75c.

CLEVELAND, OHIO—1218 Standard Bldg. Manager: Edwin C. Reminger. Service charges: Clearance statement, \$1; Assignment of traffic, \$2.

COLUMBIA, S. C.—1316 Washington St. Manager.

ager: J. T. Outlaw. Service charges: No charge for clearance statement; assignment of equipment or traffic (partial or full load)—5c per 100 lbs. up to 4000 lbs.; 3c per 100 lbs. above 5000 lbs.; min-

num charge, 50c; maximum, \$5.
COLUMBUS, OHIO—3660 A.I.U. Bldg. Manager: Harvey G. Wagner. Service charges: Clearance state-ment, 25c; lease of vehicle, \$1; traffic assignment, \$1. DALLAS, TEXAS—301 North Market St. Man-

DALLAS, TEXAS—301 North Market St. Manager: Edwin R. Joyce. Service charges: Clearance statement, 25c; Assignment of traffic—one to 100 miles, \$1; 101 to 200 miles, \$2; over 200 miles, \$3. DENVER, COLO.—410 Denham Bldg. Manager:

William A. Bosma. Service charges: Clearance statement, 10c; Assignment of traffic, 25c per ton with

nimum charge of \$1.
DES MOINES, IOWA—400 S.W. Ninth St. Manager: John I. Petty. Service charges: Clearance statement, 25c; assignment of traffic, \$1.

DETROIT. MICH.-1627 W. Fort St. Manager:

DETROIT, MICH.—1627 W. Fort St. Manager: Carl S. Holecheck. Service charges: Clearance state-ment, 50c; Assignment of traffic, \$1. DISTRICT OF COLUMBIA—1525 New York Ave. N.E. Manager: J. R. Scott. Service charges: As-signment of traffic, \$1.

EVANSVILLE, IND .- 410 Third & Main Bldg. Manager: Leslie Lacroix. Service charges: Clearance statement, 50c; Assignment of traffic, \$2.50.
FARGO, N. D.—406 First Natl Bank Bldg Man-

ager: W. H. Clemens. Service charges: Clearance statement, 25c; Assignment of traffic—up to 100 miles, \$1; 101 to 200 miles, \$2; over 200 miles, \$3. In lieu of above charges, a carrier may elect to pay on a monthly basis of \$2 a month.

FLINT, MICH .- 509 Harrison St. Manager: Miss

Ann Marvoth. Service charges: Clearance statement, 50c; Assignment of traffic, \$1.

FORT WAYNE, IND.—826 Ewing St. Manager: Scott E. Weller. Service charges: Clearance statement, \$1; assignment of traffic (partial or full load),

\$1; lease of equipment, \$1.
FORT WORTH, TEXAS—701 Pecan St. Manager:

Fred E. Kibler. Service charges: Clearance statement, 25c; Assignment of traffic—up to 100 miles, \$1; 101 to 300 miles, \$2; over 300 miles, \$3. FRESNO, CALIF.—1837 Merced St. Manager: Harry R. Gayford. Service charges: Clearance statement, 25c; Assignment of traffic, partial or full lead \$1.

GRAND RAPIDS, MICH .-- 101 Lyon St. N.W. Manager: Howard H. Harlow. Service charges: Clear-ance statements—from one to 10, \$1.50 each; 11 to 50, \$1 each; 51 and over, 50c each. Assignment of

GREELEY, COLO.—716 Twelfth St. Manager:
Miss Sara Anderson. Service charges: Clearance statement, 10c; Assignment of traffic—25c per ton with um charge of \$1.

MINIMUM charge of \$1.

HAGERSTOWN, MD.—113 Washington St. Manager; Miss Betty M. Winn. Service charges: Clearance statement, 25c. For carrier having freight to transport or for carrier transporting freight, \$1 (\$2 per contract)

HOUSTON, TEXAS-1006 Washington Ave. Manager: B. Frank Johnson. Service charges: Clearance statement, 25c; Traffic assignment up to 100 miles.

\$1; 101 to 300 miles, \$2; over 300 miles \$3.
INDIANAPOLIS, IND.—611 K. of P. Bidg. Manager: Mrs. Catherine L. Goldsboro. Service charges: am assistance or service charge is \$5. addition, there is a charge for each clearance statement over and above four per mouth—25c. Assignment of traffic—1 to 100 miles, \$1: 101 to 300 miles, \$2; over 300 miles, \$3.

KANSAS CITY, MO.-127 Livestock Exchange Bldg. (TURN TO PAGE 126, PLEASE)



Champ-Items No. 951 Radius Arm and Brake Silencer for Chevrolet knee-action models 1934-38 and Pontiac 1934-36. Eliminates all rattle and prevents further wear by applying constant pressure to arm and brake plate. Can be installed in a few minutes. (U. S. Patent No. 2147178).

List price\$1.60 per pair

Champ-Items No. 949 Self-threading Oversize Drain Plugs for all popular makes of cars and trucks. Here is a real life-saver when drain plug is stripped or lost.

No. 949A-1/2" Oversize for Chevrolet, Pontiac, Oldsmobile, and GMC truckList 30c each

No. 949B-5/8" Oversize for Buick, Hupmobile, and Packard... List 35c each

No. 949C -1/6" Oversize for Oldsmobile, LaSalle and GMC truck..... List 35c each

No. 9496—3/4" Oversize for Ford, Studebaker, and Cadillac List 35c each

Champ-Items No. 407 Oversize and Standard Rear Wheel Studs, for cars and trucks - used when threads are stripped or stud is broken off; or when wheel flange

(Pat. No. 2,257,441)

holes and axle flange holes are worn. Made of high tensile strength steel. (See your Jobber for lists of sizes and makes). List price...... 20c to 35c each





CHAMP-ITEMS, Inc. 6191 MAPLE AVE., ST. LOUIS, MO.

1200 Units Given Valvoline Protection





Valvoline Oil Company 1761 Elmore Street Cincinnati, Ohio

Under present conditions, when new equipment is practically unbring to the importance of high quality lubrication, coupled with mottainable, the importance Good lubrication, coupled with cannot be over-emphasised. Good lubrication, coupled with life of fleet equipment and, in this way, make a definite contribution to our war effort.

After five years of continuous experience with Valvoline, it is a specific for protection of our can highly recommend this product for protection of ford, internal combustion motors in our fleet. We are using ford, the continuous combustion motors in the continuous truoks and tractors, the continuous with Valvoline Motor Oil. The protection of the continuous continuous with Valvoline Motor Oil. The continuous continuous with Valvoline Motor Oil.

COMMERCIAL MOTOR FREIGHT, INC. Ray Ward, Vige President
In Charge of Maintenance

WHI IKN

"I highly recommend Valvoline"

Says

W. RAY WARD COMMERCIAL MOTOR FREIGHT, INC. COLUMBUS, O.

Where cold performance-records are maintained-where the big fleets make every drop of motor oil count-that's where Valvoline's superiority is proved. If you want the same type of cost-analysis made for your fleet - use Valvoline's Fleet Laboratory Service. It is saving money now-in these crucial times-for operators all over the nation.

Write today to the nearest Valvoline office. The service is free.

Get VALVOLINE "X-18"

All-Season All-Purpose

GEAR LUBRICANT

Another Valvoline quality product that has stood every test for millions of miles.

VALVOLINE OIL COMPANY Cincinnati, O. 580 E. Fifth St.

New York - Chicago - Atlanta - Los Angeles

SAVE MONEY - KEEP 'EM ROLLING

with The 1st Pennsylvania Oil

JOINT INFORMATION OFFICES

(CONTINUED FROM PAGE 124)

Manager: James E. Lockwood. Service charges: Clearance statement, 25c. Assignment of traffic,* 25c. *Option: Annual hasis, \$18.00 per year. LANSING, MICH.—315 Hollister Bldg. Manager: H. C. Kuhnert. Service charges: For each service rendered—50c.

LOS ANGELES, CALIF.—122 E. 7th St. Manager:

LOS ANGELES, CALIF.—122 E. 7th St. Manager: George G. Grant. Service charges: Clearance statement, 25c; Assignment of traffic, \$1.

LOUISVILLE, KY.—701 Republic Bldg., 5th & Walnut Sts. Manager: Lew Ullrich. Service charges: Clearance statement, 25c. Assignment of traffic—1 to 100 miles, \$1; 101 to 300 miles, \$2; over 300 miles, \$3. Assignment of empty equipment*—1 to 150 miles, \$1; over 150 miles, \$2. (*AAA mileage shall govern.) mileage shall govern.)

LUBBOCK, TEXAS-1801 Texas Ave. Manage W. D. Benson, Jr. Service charges: Clearance statement, 25c; Assignment of traffic (partial or full load)—up to 100 miles, \$1; 101 to 300 miles, \$2; over 300 miles, \$3.

MANSFIELD, OHIO—3 N. Main St. Manager: James L. Eberly. Service charges: Glearance state-ment, 50c; Assignment of traffic, \$2.

MEMPHIS, TENN.—720 Linden Ave. Manager: Charles E. Steele. Service charges: Each clearance statement issued in excess of four per calendar month —50c each. Assignment of equipment or traffic— -50c each. Assignment of equipment or traffic-100 miles or less, \$1; 101 to 300 miles, \$2; over 300 miles, \$3.

MOLINE, ILL .- 301 Ninth St. Manager: The M. Smith. Service charges: Clearance statement, 25c. A carrier furnishing equipment for the movement of traffic from one to 100 miles, \$1; 101 to 300 miles, \$2; over 300 miles, \$3 (AAA mileage shall govern). In lieu of the above charges, carriers may elect to pay a flat rate per month (payable in advance) which

is \$5 for common carriers, \$3 for contract carriers and \$2 for private carriers.

MUSKOGEE, OKLA .- 207 Municipal Bldg. ager: Ted Schwachhofer. Service charges: Clearance statement, 50c. Office will receive 5% of total transportation charges assessed.

NASHVILLE, TENN.—619 4th Ave. S. Manager: Mrs. Loretta B. Hickey. Service charges: Clearance statement, 25c; Assignment of traffic, 5c per 100 lbs. with a minimum of \$1 and a maximum of \$7.50 to be paid by carrier receiving freight. Two dollars to be paid by the lessor of a motor truck.

NEW ORLEANS, LA.—1461 Magazine St. Manager: Robert Matthews. Service charges: Clearance statement, 25c; Assignment of traffic or vehicle—10.100 miles \$1.101 to 200 miles \$2.00 miles \$2.

to 100 miles, \$1; 101 to 300 miles, \$2; over 300

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miles, \$3. (AAA mileage to govern.)
NEW YORK, N. Y.—90 West St. Manager: Harold Connor. Service charges: For each service rendered, \$1.

OMAHA, NEB.—2615 N Street. Manager: H. F.
Lindberg. Service charges: Clearance statement, 25c;
maximum charge of \$2 per month per operator.

ORANGE, CAL.—302 W. Maple St. Manager:

J. D. Spennetta. Service charges: Clearance state-ment, 25c; where tonnage is obtained the charge will

ment, 25c; where tonnage is obtained the charge will be 5% of the gross revenue, minimum, \$1.

PHOENIX, ARIZ.—45 W. Lewis Ave. Manager: Robert F. Goff. Service charges: Clearance statement, 25c; assignment of freight, based on length of trip—1 to 100 miles, \$1; 101 to 300, \$2; over 300, \$3.

PITTSBURGH, PA.—Fort Pitt Hotel. Manager: Robert E. Cox. Service charges: Clearance statement, 35c; Assignment of traffic (full or partial load)— up to 300 miles, \$1; over 300 miles, \$2.

PORT HURON, MICH. 1231 Twelfth Ave. er: Raich Miller.

PROVIDENCE, R. I.—Room 503, 85 Westminster St. Manager: Francis E. Nute. Service charges: Clearance statement—empty vehicle 25c; Traffic as-

PUEBLO, COLO.—211 W. 5th Street. Manager: Esther M. Santmyer. Service charges: Clearance state-ment, 10c; Assignment of traffic, 25c per ton with a

nimum charge of \$1.

ROCHESTER, N. Y. 15 Circle St. Manager: orris A. Staples.

ROCKFORD, ILL.—121 Loomis St. Manager:

Theodore H. Nelles. Service charges: Clearance statement, 25c; Assignment of traffic or vehicle—1 to

ent, 20c; Assignment or trame or venicle—1 to 100 miles, \$1; 101 to 300, \$2; over 300, \$3. ST. LOUIS, MO. Room 228—Claridge Hotel. anager: Wm. L. Patterson. ST. PAUL, MINN.—1957 University Ave. Manjer: Lou Hosking. Service charges: 10c registra-

tion fee for each vehicle. No additional charge for clearance statement. When a carrier receives a load of freight through the Joint Information Office, the charge will be 5% of the revenue accruing to such carrier, with a minimum fee of 25c. This latter fee will be in addition to the 10c registration fee.

SACRAMENTO, CALIF.—4850 Stockton Blvd. Manager: T. M. Fitzgerald. Service charges: Clearance statement, 25c; Assignment of traffic, partial or full

SAN ANTONIO, TEXAS-603 N. St. Mary's St. SAN ANTONIO, TEXAS—603 N. St. Mary's St. Manager: D. R. Thomas. Service charges: Clearance statement, 50c; Assignment of traffic—1 to 100 miles, \$1: 101 to 300, \$2; over 300, \$3. SIOUX CITY, IOWA—119 Livestock Exchange Bldg. Manager: John Shannahan. Service charges: Clearance statement, 5c; 10c for each partial or full load.

SOUTH BEND, IND.—802 S. Lafayette St. Manager: St. Manager: St. Manager: Manager

south Bend, IND.—802 S. Larayette St. Manager: James E. Gilroy. Service charges: Assignment of traffic or vehicle—1 to 100 miles, \$1; 101 to 300 miles, \$2; over 300 miles, \$3. Clearance statement. 25c. (AAA mileage to govern.)

SPOKANE, WASH.—512 Columbia Bldg. Manager:

R. P. Corolus. Service charges: Clearance statement, 25c; Assignment of traffic—up to 100 miles, \$1: 100 to 200 miles, \$2; over 200 miles, \$3.

SPRINGFIELD, OHIO.—Chamber of Commerce Bldg. SPRINGFIELD, OHIO.—Chamber of Commerce Bldg.
Manager: Guy L. Cory. Service charges: Clearance
statement, 50c; Assignment of vehicle or traffic, \$1.
STOCKTON, CALIF.—1327 S. Wilson Way. Manager: Oren A. Howard. Service charges: Clearance

statement, 25c; Assignment of traffic, partial or full

WAUSAU, WIS .-- 105 Prospect St. Manager:

WAUSAU, WIS.—105 Prospect St. Manager: Franklin H. Seefeldt. Service charges, 25c each. WHEELING, W. VA.—45 14th St. Manager: Richard E. Fuqua. Service charges: Clearance statement, 25c; Assignment of traffic—1 to 100 miles, \$1; 101 to 300 miles, \$2; over 300 miles, \$3. YORK, PA.—1339 E. Philadelphia St. Manager: George W. Forrest. Service charges; Clearance statement, 35c; reporting one or more loads to be moved, 25c; receiving load, \$1; receiving from half to full load, 50c.

YOUNGSTOWN, OHIO. 220 Hubbard Road. Man-er: Merle H. Fullerton.



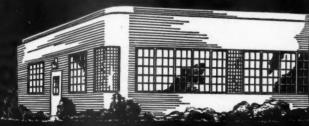
*BALTIMORE WAR STORY *

It was about a year ago. Pearl Harbor was a smarting wound only a few weeks old. America's warplanes had to have piston rings that were a year ahead of anything then in the air.

American Hammered was ready—was actually doing the job. Ever since World War I, A-H rings had been contributing to faster and more powerful planes; had played their part in the establishment of practically every new aviation record and accomplishment. But even American Hammered couldn't make the enormous quantities of aviation piston rings required for United Nations' plane production. No one factory could.

So the leading piston ring manufacturers were invited to the American Hammered plant at Baltimore. A-H threw open both laboratory and factory. Nothing was held back. Patents, methods, processes and even special equipment developed by American Hammered engineers for microfinishing aviation rings were shared for combined war production.

In the American Hammered research laboratory, A-H engineers continue their development of piston rings that are a year ahead of the planes on the fighting fronts. They contribute to United Nations' air supremacy by finding out how piston rings will perform before the rings are made!—A miracle that puts piston ring research on a production basis. A-H is developing tomorrow's automotive history today.





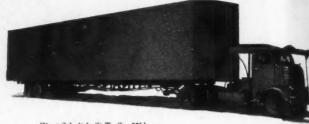
American Hammered Piston Rings

FOR CARS * TRUCKS * BUSES * TRACTORS

Better by 25 years of Engineering aviation

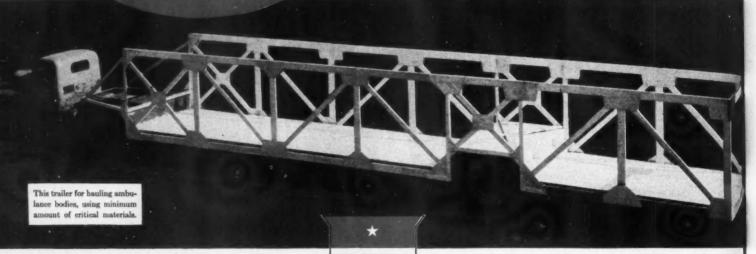
a KOPPERS aviation

Call Schult Schult Schult Schult I TRANSPORT JOBS



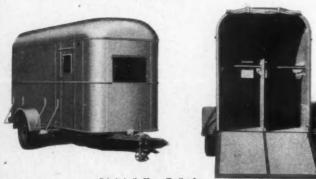
Giant Schult-built Trailer 55' long—
19' longer thau a Box Car.







Special Schult-built Trailer for U. S. Signal Corps.



Schult-built Horse Trailer for U. S. Army Motor Transport.

If you have several chassis that can be converted to much needed transport trailers, or need completely built special trailers, call Schult. The special units illustrated give you an idea of the variety of big and small jobs being produced by us . . . Schult "Knows how" to build with non-critical materials and make full use of existing equipment . . . Because of the scarcity of precious materials and the element of time, don't experiment, call Schult. We have the plant facilities and the organization of specialists to solve your transport problem . . . Call, wire or write today.

SCHULT

TRAILERS INC., DEPT. 3502, ELKHART, IND.

WASHINGTON RUNAROUND

(CONTINUED FROM PAGE 27)

nothing more than to compel operators to make a saving in mileage which they failed to effect by voluntary means. It may not be considered backing down, but there has been a resurgence in ODT circles of faith in the value of voluntary cooperation. Joint action plans are being pushed, with transportation men expert in the various industries doing the pushing. New General Orders are going the rounds of industry leaders for their reactions before the service-curtailing, mileage-saving prescriptions they contain are made binding by Eastman's signature. Some of these already have the approval of many operators to whom they apply, operators who thereby have shown a willingness to cooperate.

The load factor formula used by ODT clerical help to determine the certificate allotments of gasoline has been widely criticized. Mr. Eastman admits the formula will not always work and that ODT knew it could not be applied in many cases. It may not be considered backing down in intent but if Mr. Eastman has no intention of being unjust to certain operators, there will have to be a relaxation of the formula in those cases.

21 Over the Top by Apr. 1

However that may be, the faults are admitted and ODT is making a valiant attempt to rectify them and hoping that 21 will be on a working basis by April 1 when the glut of temporary rations is ended. That is a hope that remains to be realized. There are some who believe that ODT is in for another, bigger headache when operators who got all the temporary rations they needed find that those rations must be deducted from the allotments given them in their original or revised certificates, when those certificates become the instruments they were intended to be.

370,000 Certificates Revised

ODT is disappointed that up to Jan. 15 only 370,000 certificates had been submitted for revision in all 500 of its offices. One-third of this number represented farmers. One reason, of course, why more operators did not request revision was the

fact that they were perfectly satisfied with the amount of temporary ration gas they were getting. They felt they had nothing to complain about. What will be their feeling when the day of reckoning comes?

Leasing May Be Liberalized

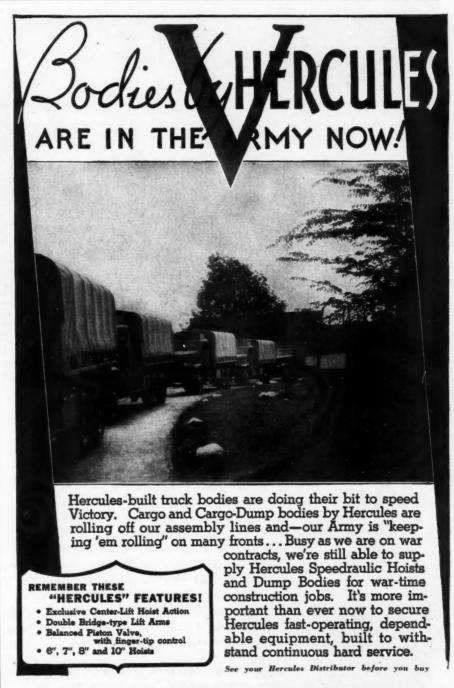
An effort is being made to get ODT to liberalize its interpretation of the ODT leasing provisions as they affect private truck operators. One private carrier may now lease his truck to another private carrier to

promote conservation but the stipulations are considered onerous.

Trifling Financial Note

We haven't seen the ODT's budget but it seems logical to suppose that the Motor Transport Division is the spendthrift in the ODT set-up. A source that we are not in position to credit with inside knowledge, says the Motor Transport Division has cost the taxpayers 14 millions of dollars so far. If that's what the MTD

(TURN TO NEXT PAGE, PLEASE)



HERCULES STEEL PRODUCTS CO.
GALION, OHIO

WASHINGTON

(CONTINUED FROM PAGE 129)

spent, it certainly does not represent the total cost to taxpayers, among whom are the operators who have spent heaven knowns how much dough complying with ODT orders.

Army and Navy Toe Mark

ODT has not given up the hope of persuading WPB to permit the man-

ufacture of trucks to replenish the civilian ration pool. It continues to insist—and the insistence has been honored so far—that the Army and Navy replace such vehicles as may be taken by them from the civilian pool. Army replacements are now being manufactured. The Navy is said to have its eye on a batch of trucks in the civilian pool but ODT and WPB have said "mustn't touch" until the Navy promises to replace. If Navy promises, the production of

replacements would be scheduled for the second quarter of this year.

Miscellany

The "bulge-brows" over in OPA still had the proposed used-truck price ceiling in their clutches as late as Jan. 22 with no indication when they would let go or what shape their victim would be in when they did. The guessing as to when the price ceiling might be imposed has stopped. . . . No official statement has been made but the report is general that Ray G. Atherton, who heads the regional and district office set up of ODT Motor Transport Division, has resigned to go with the American Trucking Associations, Inc., where No. 1 man Ted V. Rodgers has been looking for a No. 3 man. No. 2 is John V. Lawrence. . . . Truck operators won their battle with Petroleum Coordinator Ickes over the banning of credit cards for gasoline purchases. Truck and bus operators will not be affected. A report was current late in January that changes would be made in ODT Allocations Section personnel. H. H. Kelly, chief of the section since its inception, was slated to assist General Young in organizing ODT's new division for claiming needed materials from WPB. Emmett Kane, Mr. Kelly's able assistant, would be moved up to head Allocations. . . . Regional inequity in the treatment of fleet operators under the compulsory tire inspection plan does not have OPA exercised. Two regions - Chicago and Cleveland-do not authorize a fleet's own tire inspector to certify tires for replacement or recapping under the rationing system. In those regions outside inspectors must do the certifying for rations. In OPA's six other regions a fleet's own inspector has authority to handle both the Certificate of War Necessity inspections and the certifications for rations.

END

(Please resume your reading on p. 28)

General Tire Buys Radio Chain

Organization of the Yankee Network. under the new ownership of The General Tire & Rubber Co. was completed in Boston, following approval of the transfer by the Federal Communications Commission. William O'Neil, president of General Tire, was named president of the network.

Mr. O'Neil also made it clear that General Tire has purchased the chain as an investment, with belief in the great future of radio and New England.







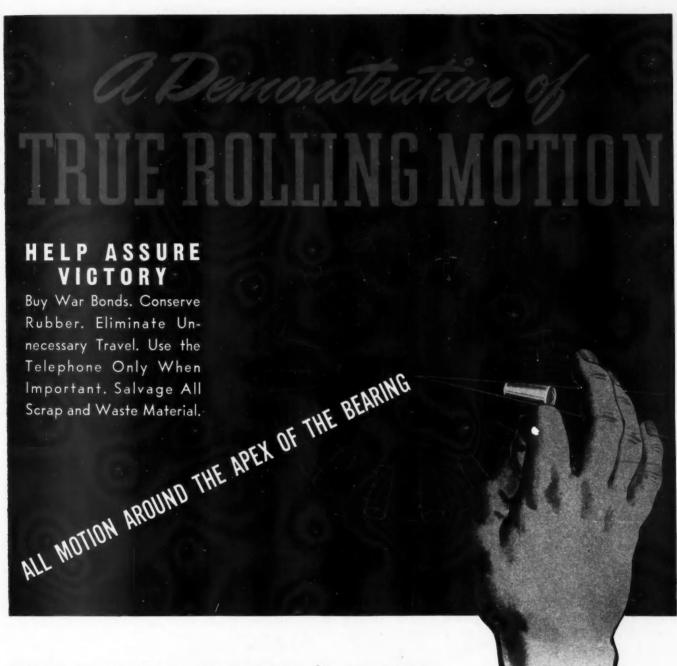
THOUSANDS of mechanics welcome these monthly bulletins for their valuable information on ignition problems.

Today—geared to wartime America—they carry a vital message. They tell you how to keep vehicles on the road without replacing ignition parts until absolutely necessary.

It may be much harder to get ignition parts tomorrow. So don't discard any part until you are sure it can't be repaired. In that way you help both yourself and Uncle Sam. When you are sure a part is beyond repair, replace it with "Blue Streak," the line of "Long-life Peak Performance." Conserve "critical" materials!

STANDARD MOTOR PRODUCTS, INC. 37-46 Northern Blvd., Long Island City, N. Y.

"The ABILITY to serve well is as important as the WILL to do so."



With the tapered roller bearing it is possible to achieve true rolling motion—whereby lines projected from all working surfaces meet at a common point on the axis of the bearing, called the apex.

But tapered roller bearing design is not necessarily synonymous with true rolling motion. For the achievement of true rolling motion is also dependent upon tapers being on apex for cone, rollers and cup of any particular bearing. Precision manufacture is another pre-requisite. So, too, is a positive method for separating rollers to prevent the generation of friction by roll-to-roll contact.

Combined in the Timken Tapered Roller Bearing are (1) correct design, (2) tapers on apex, (3) precision manufacture, (4) the multiple-perforated cage—which together result in true rolling motion with greater operating efficiency and longer bearing life. There is no secret to the tremendous preference for Timken Bearings.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO Service-sales Division

TIMKEN
TAPERED ROLLER BEARINGS

Tinken Bearings
are demonstrating their
superiority to millions of American coldiers, exilors and marines.
When these men recume civilian
hits, the preference for Timkes
Bearings will be stronger
than ever before.



THE full facilities of the Burd Piston Ring Company, plus the hard-earned experience . . . the valuable "know-how" of its loyal workers . . . are contributing to the war effort. While the production of airplane rings and precision parts is rapidly going forward—Burd Piston Rings are still helping to keep essential motor, tractor, and transportation facilities operating at full efficiency. Likewise, the time and material that was formerly devoted to the production of Hadees Heaters is now being diverted to the winning of the war also. That's how Burd Works For Victory!

THE BURD PISTON RING COMPANY, Rockford, III.

Associate Company . . . Liberty Foundries Co.

Manufacturers of Hadees Heaters



A PLAN TO PUT IDLE HAND TOOLS TO WORK

The scarcity of well-equipped, skilled mechanics through the nation's repair shops is matched only by the scarcity of hand tools for the mechanics endeavoring to keep vital transportation rolling and for the newcomers, older men and women being trained to replace those drafted for war service.

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A mechanic, no matter how highly trained, is helpless without hand tools to work with, and the shortage of wrenches and hand tools grows ever more critical. The established mechanic with a complete tool set inevitably experiences wear in certain tools to the point where they become useless or dangerous to work with. Even the best of wrenches break occasionally under excess leverages; others get lost. Replacements of these tools are a vital necessity to the efficiency of the mechanic—he cannot tighten a 9/16-in. nut with a ½-in, wrench.

The hundreds of newly trained maintenance mechanics also must have wrenches and hand tools, even though a limited selection, with which to carry on the transportation maintenance work formerly handled by those better equipped mechanics now lost to the industry.

Our armed services also need tool equipment, in enormous quantities, and these requirements must come first. This makes it impossible for the wrench and hand tool industry to furnish immediately all the tools urgently needed by the mechanics on the home front.

The Snap-On Plan

One solution to these problems has been advanced by Snap-On Tools Corp., Kenosha, Wis. Stated briefly, the plan urges all mechanics taken out of maintenance service to keep their tools in circulation by selling them to others needing such tools. To complete the cycle, the plan also proposes that men or women needing such tools contact some central or sectional point stating their needs. These may be filled direct or reference will be made as to where the needed tools may be obtained. Snap-On is publicizing the idea widely and has organized its facilities. A separate personnel has been assigned to this task. This group is formally known as the Tool Enlistment Division of the Snap-On Tools Corp., with quarters at 8028 28th Ave., Kenosha, Wis. In reaching the thousands of mechanics to whom this plan would apply, Snap-On made the following statement.

"If you are called to military service, or for any other reason your tools are not in active use, put these tools back into the war effort. If you can't contact a mechanic who needs them, see your Snap-On man, or call the nearest Snap-On Branch Office, or write to our Tool Enlistment Division for full details on what this plan can do for you. Our Tool Enlisters will arrange to make a fair cath appraisal of your tools and put them back to work."

The plan has been received with much favorable comment. One statement pointed out that when a factory worker quits, usually his employer loses only the worker's services. But when a garage mechanic leaves his job, a complete set of valuable and almost irreplacable set of tools goes out with him.

In view of the critical shortages of new tool equipment, to allow that set of tools to be taken out of the shop and packed away in some attic or left to rust away by disuse in some basement corner is a very disturbing condition. And yet there must be literally thousands of such tool sets scattered around basements and attics and otherwise stored away by the men who have left their jobs for military or other reasons.

Truck Progress Sketched for Transportation Board

Presentation of a report on commercial motor vehicle improvements from 1921 to 1942 was made by the truck manufacturing group of the Automotive Council for War Production to the Federal Board of Investigation and Research in Washington, Jan. 25. The purpose of the report was to emphasize the effects of technical improvements upon the cost and usefulness of highway transportation. (A summary of this report will be published in the March issue.—Ed.)

CCJ NEWSCAST

(CONTINUED FROM PAGE 60)

transmissions now used in many of the Army's 30-ton tanks. Shortly before his death Mr. Fink had the gratification of seeing all three Mack plants presented with



the Army-Navy "E" award for excellence in production.

He is survived by his widow, Mrs. Clara Fink; a daughter, Mrs. H. Fillis; and a sister, Mrs. A. G. Sherman.

Joseph Englaender, of Trailer Co. of America, Dies at 62

Joseph Englaender, chairman of the board of directors of The Trailer Co. of America, died Jan. 1 after an illness of several months. Mr. Englaender was 62 years old.

Beginning his business career as chief clerk for Columbia Terminals Co., St. Louis, Mr. Englaender later became vicepresident. In 1922 he assumed the additional responsibility of presidency of the Lapeer Trailer Corp., Lapeer, Mich. He resigned from Columbia Terminals in 1928 to accept presidency of The Trailer Co. of America, which was the outgrowth of the merger between Lapeer and Trailmobile Co., of Cincinnati, Ohio. In 1932, when Highland Body Mfg. Co. was made a subsidiary of The Trailer Co. of America, Mr. Englaender was elected president of that corporation. He was elected chairman of the board of directors of The Trailer Co. of America in 1941 and retained his position as president of Highland Body.

He leaves his widow, Mrs. Mabel Englaender; a son, Raymond; a daughter, Marynell, and a sister, Mrs. Alice M. Askins, all of Cincinnati.

99,775 Vehicles Rationed to Date

Since the rationing program became effective March 9, 1942, a total of 99,775 vehicles of all types has been released up to Jan. 16, 1943. This total includes 22,458 light, 52,795 medium, and 12,294 heavy trucks; 7,144 trailers, and 5,084 miscellaneous vehicles.

(TURN TO PAGE 153, PLEASE)



★ WHAT KEY PASTE IS ... Key Graphite Paste is the oil-proof—heat-proof sealer to be used wherever high pressures, high temperatures, and oil and gaso-line-proof conditions are involved. It expands when heated... fills in all irregularities... enables the reuse of worn and battered gaskets and fittings and preserves new ones.

WHAT KEY PASTE DOES ... Leak-proof joints can be made up economically on cylinder heads and manifold gaskets ... crankcase gaskets ... carburetor and gasoline lines ... differentials ... and for all oil and gasoline connections in the service station.

Write for a liberal Free sample of this KEY Paste today . . . no obligation.

2612 McCasland Avenue

East St. Louis, Illinois







Write for your copy of the Metaffin bulletin today. You'll find the complete sludge-con-

Sticky valves and rings, clogged oil lines and all the other troubles you have experienced with sludge in the past tend to multiply when your rolling stock is operated at war speed. More than ever before you need

MAGNUS METAFFIN

First, to clean sludge from the motor where it has already gotten out of control and second to treat your lube oil with Metaffin so that water of condensation is kept dispersed, thus preventing further formation of harmful sludge and varnish.

Metaffin will pay you real dividends in reduced repair and maintenance costs caused by the interference of sludge deposits with proper lubrication.

Look into it-now!

MAGNUS CHEMICAL COMPANY

Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emusifying Agents and Metal Working Lubricants.



Garwood, N. J.

SERVICE REPRESENTATIVES IN ALL PRINCIPAL CITIES



For 1943 * * * * * *

A — all aims are for Victory in this year ahead, we must push ourselves—not wait to be led.

may we "give out" for our boys at the Front—
to speed their return from bearing the brunt.

each day let us work, our money to save our purchase of bonds sends arms to the brave.

R — right now is the time to turn on the power to shorten this war, each day and each hour.

I — "I can" and "I will" are words that we need, let's back up the Front in action and deed.

C -- "can't do it today"—are words of the past, let's sew up this thing—why let it last?

A — all efforts we make are not made in vain, war's end we thus seek so peace can long reign.

☆ Keep 'em Rolling!

American Safety Tank Company

Kansas City, Missouri



INNER-SEAL KEEPS COLD OUT WARMTH IN

... real protection for the interior of any automotive vehicle. INNER-SEAL is a tough, twofisted waterproofed weather stripping built to withstand severe service in all sorts of weather. Used for years as standard equipment by manufacturers of passenger cars, trucks, trailers, buses and taxis.

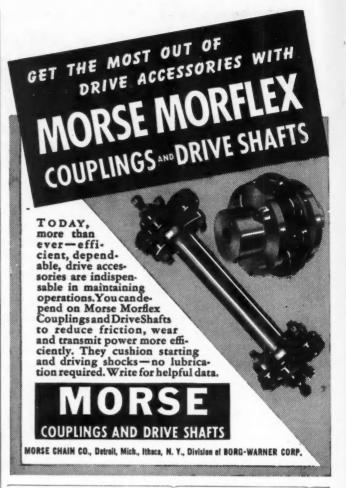
INNER-SEAL WATERPROOFED WEATHER STRIPPING

Apply this highly efficient weather stripping to doors and windows—keep cold out, warmth in.

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Established 1837



Compact—Fast—Accurate TOBIN—ARP Rod Boring Attachment



Bores semi-finished babbitted rods, inserts in the rod and the rod forging itself. Designed to fit our Shell Bearing Boring Machine. Convenient to use. Handles all rods up to and including R. D. 8 Caterpillar Diesel. For resizing V8 Ford rods quickly, it can't be beat.

Write for complete details on it, also ask for particulars on our Shell Bearing Boring Machine and Line Boring Machine.

TOBIN-ARP MFG. CO.

913 Washington Ave. S.

Minneapolis, Minn.





MATERIALS . . . EQUIPMENT

Faster, Easier Parts Salvaging!

From now until that day when the last gun is fired, you will have From now until that day when the last gun is fired, you will have to salvage EVERY worn or broken truck part capable of giving further service. Crankshafts and carburetors, spring hangers and clutch parts . . . these and many more must be welded, coated, ground, machined, straightened, plated or painted, as their constitute indicates.

But . . . BEFORE doing any repairing . . . first thoroughly degrease those parts! Why? Because a clean, grease-free part is easier to handle, can be inspected and judged worthy of salvage that the company of the comp FASTER! An easy-to-build cleaning tank, charged with a fastworking Oakite material, provides these advantages. And at low working Oakite material, provides these advantages. And at low cost, too . . . in view of the time you save. Won't you let us show you how this helpful Oakite idea can work in your shop? No obligation . . . write today.

OAKITE PRODUCTS, INC. 26D Thames Street, New York

Technical Service Representatives Located in All Principal Cities of the United States and Canada

DEGREASING speeds FLEET MAINTENANCE

CCJ NEWSCAST

(CONTINUED FROM PAGE 151)

Bissell Made Chairman of Mack Board; Ruhf Advanced

Election of Louis G. Bissell as chairman of the board has been announced by Mack Trucks, Inc. Mr. Bissell, a member of the law firm of Chadbourne, Wallace, Park & Whiteside, has served the company for many years as a director and counsel.

Also announced was the election of Charles T. Ruhf as president of Mack Mfg. Corp. and executive vice-president of the parent company, Mack Trucks, Inc. Mr. Ruhf was formerly operating vicepresident in charge of factories and has been with the company since 1912. In 1920 he was appointed assistant to the factory manager of the Allentown plant in which position he served until he was appointed factory manager in 1937. In 1938 he was made operating vice-president of Mack Mfg. Corp. and Mack Trucks, Inc., managing the three Mack factories at Allentown, Pa., Plainfield, N. J., and New Brunswick, N. J.

FWD Donates Truck to Marines

A new fighting FWD Marine Corps truck went on its way to the Pacific to help win the victory for Uncle Sam's fighting leathernecks and it didn't cost the government a cent. The new FWD truck was donated to the Marines by FWD employees who contributed three hours' pay toward the purchase of the truck; the company contributing much of the material required

White's 1943 Truck Conservation Program Outlined at Meetings

Following up its pioneering move of last year to keep the vital motor-transportation units of the nation running for the duration, the White Motor Co. has planned an even more intensive service program for 1943. Behind this lies the recognition that today trucks are not only irreplacable, but, in the face of their growing age, they are called upon to do the greatest hauling job that ever fell to the lot of motor vehicles. In fact, the American war effort depends in large measure on their ability to move goods rapidly and efficiently. No substitute conveyances can be found.

Recognizing the great need, White last year converted its entire sales force into an army of trained service men whose mission it was to spread the gospel of conservation and truck maintenance in the light of war emergency conditions. Behind it all was a practical plan of preventive maintenance and parts conservation.

In order to acquaint every White Motor salesman, parts man, mechanic, supervisor, and office employee with existing responsibilities and the program by which they will be met, meetings are being held all over the country. Under the plan, a series (Turn to Page 154, Please)



WGB

Removes Grit and Water Without Affecting Modern Oils

Many of today's best oils contain detergents to keep varnish from forming. Many of today's oil filters remove these additives. But not W.G.B. The big fibre cartridge in W.G.B. Clarofiers removes grit, water, and colloidal carbon, leaving the oil amberclear with all its protective properties. Refills are cheaper than oil changes and are made quickly and without tools. Specify W.G.B. for a sturdy, simple proved clarifier which saves time, money, oil, overhauls, and irreplaceable engine parts.

Write today for this free book. See why W.G.B. Clarofication pays. See correct mod-els for gas and Die



OIL CLARIFIER, INC. KINGSTON, N. Y.

MAXIMUM SERVICE FROM YOUR PRESENT TIRES



is expected by your ration board. They may refuse certificates to those who do not give their tires proper care.

Here is an easy way to make sure that you are getting the very best possible out of each tire. Use an EVERHOT Electric Branding Iron together with the EVERHOT Tire Record System. Put your own number on your tires or put the Serial Numbers on both sides in large figures that can be plainly seen.

EVERHOT Branding Irons have ten digits (0-9) on the disc, making possible any combination of figures. Priced at \$35.00 f.o.b. Maywood, Illinois.

Literature and sample record forms upon request.

Everhot MFG. CO., Maywood, III.





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. . . have greater value, economy and precision craft-manship! Send for free folder, today.

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Manufacturers of Everything of Canvas
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Newark * Beston * Buffale * Chicage * Cloveland * Detroit * Milwaukee * Philadelphia * Pittsburgh * Los Angeles * Dallas, Texas * Cincinnati * Atherton, Md.



(CONTINUED FROM PAGE 153)

of two-day meetings was scheduled at 12 key-city branches, starting in December, as a preparatory step. This was to be followed by a series of 12 meetings at all branches and distributorships, and these meetings are still going on.

Three executives from headquarters—J. N. Bauman, Lee Lundy, and H. D. Laidley—took to the road and instructed branch managers, wholesale men and distributors on how to conduct meetings for the benefit of dealers in their territories. At these dealer meetings the importance of keeping trucks in good operating order for the big job ahead is stressed, and White representatives are told what they can do as their contribution. With the aid of books and charts, every phase of the service program is explained, including repair, rebuilding, preventive maintenance, parts conservation, sales, and management.

Particularly stressed at the meetings are White's preventive maintenance plan and its parts conservation plan, which proved of such value last year, and which will be carried out even more intensively during 1943.

In order to make White service most efficient, the discussions take up shop layout and the various equipment positions which would facilitate operations, inspection methods and the proper use of tools and machinery, the requirements of preventive maintenance, repair and rebuilding operations, and the handling of parts. Studies also cover the hiring and training of shop personnel, service market opportunities, and the various phases of management control—everything, in fact, which would aid in the service program. When this series of meetings is completed, White representatives will be well advised on how to promote and conduct such work with the utmost efficiency. No effort is being spared to make this year's contribution to the motor transportation industry the greatest

American Hammered First in Two Classes With Army-Navy "E"

First piston ring manufacturer to receive the honor, the Army-Navy "E" flag was presented to the American Hammered Piston Ring Division, Koppers Co., at the Baltimore plant on Jan. 23. American Hammered was also the first sub-contractor so honored.

(TURN TO PAGE 156, PLEASE)





EXCLUSIVE WELDIUM PROCESS SOLVES LEAKAGE PROBLEMS

AIRTEX AUTOMOTIVE CORPORATION

Inherent heat of combustion and alternate suction and compression action repairs internal leaks due to cracked cylinder blocks, heads, valve ports. External block and head leaks repaired permanently in most cases.

When liquid runs from the tail pipe we guarantee to repair the leak with LUSCO CYLINDER-BOILER "WELD"ium.

OILER "WELD"ium.

Radiator leak repairs carry an unconditional
90-day guarantee when repaired with
LUSCO WELD Cubes! (Containing

Has no stop leak objections.

Lusco Cleans the System.

C. F. LUSK CO.
6531 Euclid Ave., Cleveland, Ohio

FAIRFIELD, ILL.

uJZLD





MOTOR TRUCKS
HAVE WHAT IT TAKES TO
"KEEP ROLLING"

They will continue to do so for you if you adhere to the U.S. Truck Conservation Corps Pledge.

STERLING MOTORS CORPORATION
MILWAUKEE, WISCONSIN



BEST FOR ALL FORD VALVES

K-D Valve Guide Puller Sets make quick and easy work of removing valves from all Ford-built motors. Sets consist of Driver for removing retainers and the big, husky, screw Puller shown in use. The most stubborn valves are all out in less than 30 minutes. See your favorite Jobber.

K-D TOOLS
The Hustlers for Your Toolbox!

HKOSH 4

★ Shock-proof Steering. Easy Driving

Simple Design. Low Upkeep Heavy Double Reduction Axles Large Roomy Comfortable Cab

Complete Range—2 to 12 ton capacity

Automatic Locking Center Differential

Service stations at convenient points throughout the United States. Write for descriptive bulletin.

OSHKOSH 4-WHEEL DRIVE SALES AGENCY OSHKOSH, WISCONSIN



Military Air Port Construction

"In Service"—At Home and Abroad

McCREARY TIRES

GIVE MORE MILES at LESS COST

Proven performance for 25 years. 20 per cent more mileage due to Bibb heat-resisting cord built into carcass and tread. Recaps deliver 80 per cent of original mileage.

Write for name of negrest distributor.

McCREARY TIRE & RUBBER CO. INDIANA, PA.



BATTERIES

built for REPLACEMENT SERVICE . GLOBE-UNION INC., MILWAUKEE, WIS.

ELECTRICAL SPECIALISTS FOR 22 YEARS

> Manufacturers of Electric Motors
> Electric Motors
> Electric Motor Grinders
> Battery Chargers
> Fast Battery Chargers
> Battery Testers Write for Bulletins

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Here's How You

Can Reduce Your

Turn Signal Costs . . .

Specify

TELEOPTIC

(one year guaranty)

Signals

THE TELEOPTIC CO. Racine, Wis.

(CONTINUED FROM PAGE 154)

Seven Large Carriers Merge

The consolidation of seven large Eastern motor carriers into Associated Transport, Inc., was completed Jan. 1 when Consolidated Motor Lines, Inc., of Hartford, Conn.; McCarthy Freight System, Inc., of Taunton, Mass.; and M. Moran Transportation Lines, Inc., of Buffalo, N. Y., ceased operating under these names and became an integral part of Associated Transport, Inc. The Southern carriers whose operations had already been consolidated were Barnwell Brothers, Inc., of Burlington, N. C.; Horton Motor Lines, Inc., of Charlotte, N. C.; Southeastern Motor Lines, Inc., of Bristol, Va., and Transportation, Inc., of Atlanta, Ga.

Associated Transport, Inc., now operates 3500 vehicles over 24,000 miles of unduplicated route extending from the Canadian border to the Gulf of Mexico, and west to Cleveland, Pittsburgh, Nashville and New Orleans. Connecting carriers serve points as far west as Chicago and St. Louis.

Each month Associated Transport's vehicles roll up approximately 6,000,000 miles, carrying 400,000,000 lb. of freight. The 1942 gross revenue for the constituent companies approximated \$30,000,000. About 75 per cent of this traffic consisted of war freight.

Cargoes are protected with what is believed to be the highest insurance carried by any highway transportation company other than armored car services. Every truckload is protected to the extent of \$200,000 and \$400,000 to \$1,000,000 insurance is carried on the cargo stored in every terminal.

Associated Transport employs 5742 workers in its executive offices in New York, its two division offices in Hartford, Conn., and Charlotte, N. C., its 89 terminals and its factory, maintenance and repair shops.

The officers of Associated Transport are H. D. Horton, chairman of the board; Burge M. Seymour, president; Everett J. Arbour, Robert W. Barnwell, and John J. McCarthy, vice-presidents; Alexis P. Scott, treasurer; John A. Sutton, controller, and Alex W. Chisholm, secretary.

DeVilbiss Awarded Army-Navy "E"

The DeVilbiss Co., Toledo, Ohio, received the Army-Navy "E" for excellence in war production, on Jan. 11.

KEEP YOUR **VEHICLES MOVING ECONOMICALLY**

VALVE SERVICING EQUIPMENT

Ask Your Jobber or write THE HALL MFG. CO. TOLEDO, OHIO

IL-SAV

PISTON RINGS

The FREE RUNNING Rings with the SAFETY CENTER UNITS

POWER QUICK IT LASTSI

See your Jobber or write WAUSAU MOTOR PARTS COMPANY WAUSAU, WIS. 2400 HARRISON BLVD

ONLY WALKER SILENCERS HAVE

SEE YOUR WALKER JOBBER ABOUT "INDIVIDUAL TUNING"

"A load behind is a trip ahead"

IMMEDIATE DELIVERY

on Open and Closed Top

AND CHASSIS

National Sales - Academ - National Service

KINGHAM TRAILER CO. INCORPORATED

LOUISVILLE

KENTUCKY

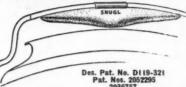


WHEEL BALANCING is now a MUST

if you want to prolong the life of your tires
Use the weights

Snugl

the U. S. Government



Fade-away BALANCE WEIGHTS

at each inspection be sure that each wheel is balanced with SNUGL fade-away BALANCE WEIGHTS and get more miles from your tires. SNUGL weights have a dove tail elim—they cannot rattle or work loose. Easy to install. Sizes $\frac{1}{2}$ oz. to $\frac{1}{2}$ lbs.

See your Jobber or write today.

Manufactured by

MID-WESTERN AUTO PARTS, 824 E. Elm St., Kokomo, Ind. Western Distributor: Kenneth V. Mills, 910 W. Pico Blvd., Los Angeles, Cal.





Trade Mark Reg. U. S. Pat. Office Pat. No. 1,438,560

Protect Your Trucks Against Skidding

The hazards of winter operation of your fleet are upon you. This year, as never before, you will try to safeguard your irreplaceable trucks—and, if you are fore-handed and economically minded, will be considering your tire chains and your stock of

MONKEY LINKS

Don't risk unnecessary accidents. Keep Monkey Links in your shop and on your trucks this winter. No tools are required; your driver can fix a break in jig time.

We'll send you samples immediately if you'll write telling us the number of trucks you have and the size chains you use.

FLOWER CITY SPECIALTY CO., Rochester, N. Y.
Or at All Reputable JOBBERS

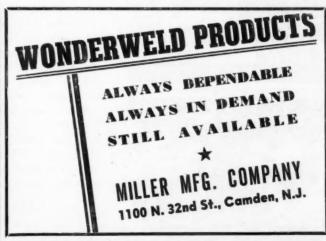


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WHITEHEAD STAMPING CO.

1685 W. LAFAYETTE BLVD. • DETROIT, MICHIGAN







Our Plant is working to capacity on "KING" Testing Equipment for the Government, and we regret that we cannot give our customary good service. However, we can ship most orders with the required priority rating.

THE ELECTRIC HEAT CONTROL CO. 9121 INMAN AVENUE · CLEVELAND, OHIO



Fulton Electric Sleet-Frost Shields ame rubber-bladed Defrosting Fans are on daty today on thousands of trucks and care, in many lands . . . providing clear-vision driving safety regardless of wea-ther. This, too, is an important war service.



Fulton Electric Sleet-Frest Shield

We made 'em before . . . and we'll make em again . . . when Victory is won.

THE FULTON COMPANY

1912 So. 82nd St., Milwaukee, Wis.

THE ACCEPTED STANDARD . . .



Mite for complete information on "SAFETY NOPS" and FIFTH WHEELS.

AUSTIN TRAILER EQUIPMENT COMPANY MICHIGAN



IT COSTS NO MORE AND TELLS SO MUCH MANUFACTURED BY PAUL KNOPF





GREATEST NAME IN SAFETY TEST AND CORRECTION EQUIPMENT

PRIVATE CARRIERS' WAR CONFERENCE

(CONTINUED FROM PAGE 53)

ment to see to it that highway transportation in this country does not fail.

Speaking of the labor problem facing private carriers, he said, "The labor situation is a vital problem, but labor does not want the war effort to be used as a guise for operators to do things that they couldn't get away with before the war."

Mr. Rogers declared preventive maintenance of trucks was, in most cases, performed satisfactorily by the large fleets; partly because most of them had definite plans before the war, and also because they have the skilled men and equipment to do the job. Speaking further on this subject, he said, "the real problem is the operator who operates only one or two trucks. Most of these operators have very little organization and no plans for PM. It is these operators who present the biggest problem in regards to the conservation of equipment by PM."

He admitted that the ODT had made some mistakes, but said that whenever they make any "boners," they will galdly rectify them whenever able to do so.

Legislation In Wartime

P. D. MacLean, Chief of Information, National Highway Users Conference, warned private carriers to watch laws for the wolf that masquerades in conservation clothing. He said that unless wartime laws are written so that they will expire at the end of the war, it may be difficult to remove them from the statute books when the war is over.

He further urged all operators to watch their state legislatures and to

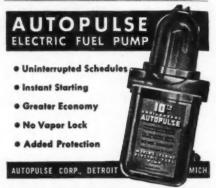
STANDARD & SPECIAL TRUCKS

ANY SIZE OR TYPE



AVAILABLE TRUCK COMPANY

2501 Elston Ave., Chicago, Illinois



ALLEY SUPERDUTY CHARGER

Meets 1942

Conditions

Bliminate Run Down Batteries for Low Gest Battery Mileage. The new, improved, Valley-Guaranteed (two years) charger connects to the lighting circuit . . is easy and economical to operate . . . no moving parts. Now it is easy and inexpensive to obtain long battery life by maintaining efficient battery charge.

Model SG-12 charges 1 to 12 6 volt batteries.

NOW ONLY \$28.00 NOW ONLY \$28.00

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nation-wide distributor organization for specialized service on dump bodies and tanks.



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MILWAUKEE DUSTLESS BRUSH

JONES PORTABLE TACHOMETER



The world's largest operators of commercial vehicles use Jones Portable Tachometers to check engine speeds for tune-ups, and setting governors, etc. Here are a few: Standard Oil Co., of La., N. J., N. Y., Shell Petroleum Co., Atlantic Refining Company, Tidewater Oil Company, Tidewater Oil Company, Keeshin Motor Express.

Mack Trucks, Brockway, U. S. Navy.

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K-D LIGHTING The right light for the right job

GO TO LIGHTING HEADQUARTERS YOUR K-D LAMP JOBBER

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HOOF GOVERNORS - Seel - Dash Control Types



FULL ENGINE POWER and ACCELERATION COMPACT . NEW FEATURES . TAMPER PROOF

HOOF PRODUCTS COMPANY 6543 S. Laramie Ave., CHICAGO, ILL scrutinize all laws dealing with truck transportation.

Certificates of War Necessity

Some of the problems confronting operators by the recent ODT order No. 21, were discussed by H. Richard Stickel, Executive Assistant, Division of Motor Transport, ODT.

Mr. Stickel stated that many features of the order are not liked by many operators, but that the ODT attempted to do the best job possible in the time available to get it into operation. The order, he said, should be in full swing by April 1st.

In order to get additional gas after Jan. 31, he said, "the private motor truck operator who has been certified insufficient gasoline will be allowed ample fuel to continue his essential operations throughout the first quarter of 1943 pending appeal, in cases where no evidence of waste mileage exists. ODT field offices have been instructed to exercise discretion in such cases, but operators should realize that failure to eliminate waste mileage will affect allotments for the balance of the year."

Regarding the Certificates of War Necessity, he said, "operators have the right of appeal from the field office decision to the regional office or direct to ODT in Washington. All certificates are subject to revision and can be raised or lowered when investigation seems to warrant it."

Mr. Stickel also pointed out that when any point in the order is found to be unreasonable, the operator should state his reasons and submit them to the ODT for consideration.

Beyer Speaks On Manpower

Otto S. Beyer, Director, Division of Transport Personnel, ODT, gave his views on the manpower problem. He said that every operator should frame his personnel problem so that



Keep Them Running L-O-N-G-E-R

Buell High Pressure Air Horns have a powerful, penetrating tone that gets attention and commands respect. They help to Keep 'Em Rolling longer and smoother by eliminating many time wasting stops and starts. Save tires, brakes, clutches and gears. Cut gas and oil consumption. Available on Priority.

Write for descriptive chart NOW

BUELL MANUFACTURING CO.

Dynamic Hole Stoppers Punctured Casings. A Punctured Casings. A few CENTS spent now will save DOLLARS and TIRES. More miles per fire is patriotic economy. KEX are more miles convenient to carry for instant use. 3 sizes meet all needs. Automotive Stores and Wholesalers Sell KEX. CENTS



Wedler-Shuford Co., St. Louis, Mo.

"TAKE IT"

The smartest, most improved unit of its type, Model V-400 Vertical Lift Landing Gear is especially adapted for heavy duty service.

Powerful-rugged-dependable.

Complete truck and trailer equipment.

Catalog on request.

HOLLAND HITCH CO. HOLLAND.

Mldfarge Quality tools

Today when tools are hard to get, it is far-sighted, as well as economical, to buy tools that will stand up under the terrific beating they have to take—Buy Quality Tools.

Quality Tools are designed for use in Fleet Shops, Automotive and Aircraft Industries and Maintenance Shops of our armed forces.

Write for catalog TODAY

TOOLS CORP. New Wilmington,





MCKAY TRUCK CHAINS

For double mileage, double economy, use the double-bar-reinforced McKay Multi-Grip Truck Chain!

THE McKAY CO., PITTSBURGH, PA., York, Pa







THERMOID COMPANY - TRENTON, N. J.

(CONTINUED FROM PAGE 159)
he can release every man within the

military age limits.

Speaking further on the problem, he said, "some method of government compulsion is in sight. Critical shortages are upon us, yet there is still time for truck operators to use volutary methods for the solution of manpower problems."

As to the employment of women, he said, "women can be used as car washers, drivers on retail trucks, gassers and even mechanics. To some operators it may mean considerable adjustments in their maintenance departments, but it must be done if we are to solve the critical manpower shortage."

Some industries, he said, can transfer men from the sales force, or warehouse, to driving trucks and replace their positions with women. Other methods by which operators can solve the manpower problem, he said, are as follows: Close some shop if practical, and pool maintenance to save mechanics; utilization of parttime workers, who can be used as standby employees; utilization of handicapped workers; and a training program for mechanics.

He urged operators to adopt a plan of procedure with local trade associations, so that when some concerns have to lay off drivers or mechanics due to curtailment, they will not be lost to the industry, but used by those who need them.

In closing, Mr. Beyer emphasized the advantages to operators of joining with trade associations and the ODT in joint planning for a mechanics training program.

Mileage Limitation

Speaking on the mileage limitation of ODT order No. 17, Mr. Edmund M. Brady, Assistant Director, Division of Motor Transport, ODT, said he believed that private carriers

20,000,000 CARS AND
TRUCKS MUST BE KEPT
ON THE ROAD TO WIN
THE WAR . LET'S ALL
WORK HARD TO KEEP
'EM UP.

Wohlett Lansing
MICHIGAN



FREE STICKY VALVES

Prolong Engine Life with

RISLONE

THE SHALER COMPANY

Waupun, Wis., and Toronto, Can.



HEAVY DUTY FOR OFF THE HIGHWAY SERVICE

— Specially Designed for —
Coal Mining—Iron Ore Mining—Copper
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It Costs No More for Trucks Specially
Built to Fit Your Needs. Have Our Engineers Visit and Analyze Your Operation.

DART TRUCK COMPANY KANSAS CITY, MO.

VITAL TO-

- Low Mileage Costs
- Easy Operation
- Maintained Schedules



* PAR *

AIR COMPRESSORS

for full volume and
top pressure operations

See Your Par Jobber

LYNCH Manufacturing Corp.

CHEVROLET TRUCKS Vehicles of Victory

ON THE FIGHTING FRONTS—ABROAD



ON THE WORKING FRONTS—AT HOME







IT WON'T BUDGE

GASOLINE, KEROSENE, FUEL OIL, HOT LUBRICATING OIL, HOT WATER, SALT WATER, ANTI-FREEZE SOLUTION . . . NONE OF THESE LIQUIDS WILL MAKE A FILM OF FORM-A-GASKET MOVE FROM POSITION, MELT OR DISSOLVE!

Permatex Form-A-Gasket used in automobile and aircraft engines is available in three types.

FORM-A-GASKET NUMBER 1 IS A PASTE THAT DRIES FAST AND SETS HARD.

FORM-A-GASKET NUMBER 2 IS A PASTE THAT DRIES SLOWLY AND REMAINS PLIABLE.

AVIATION FORM-A-GASKET IS A HEAVY LIQUID THAT SETS QUICKLY AND DOES NOT DRY.

These three Form-A-Gasket products are used in many industries wherever leakproof, pressure-tight flange unions, gasket assemblies or screw thread connections are required.

PERMATEX COMPANY, INC. Sheepshead Bay, N.Y., U.S.A.





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COMMERCIAL CAR JOURNAL

THE WOOG OF LONGER-LIVED CHASSIS PARTS

YOU can cushion chassis parts against road-shocks, lengthen their life, and reduce the time and labor spent in lubricating shackles, steering connections, etc. . . . by using Texaco Marfak.

Texaco Marfak provides a tough, adhesive-cohesive film that clings to metal, resisting the severest rain and road splash.

The reason behind Marfak's longer-lasting protection is this—while it liquefies inside a bearing, providing liquid lubrication, it maintains its original consistency at the outer edges, thus sealing itself in while sealing out dirt, grit, water.

For wheel bearings in heavy duty service, specify *Texaco Marfak Heavy Duty*... it stays in bearings and off brakes... protects against wear.

Outstanding performance has made Texaco first in each of the fields listed in the panel.

These Texaco users enjoy many benefits that can be yours. A Texaco Automotive Engineer will gladly cooperate in the selection of the most suitable lubricants for your equipment . . . just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York, N.Y.

THEY PREFER TEXACO

*More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

*More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

*More locomotives and cars in the U. S. are lubricated with Texaco than with any other brand.

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

TEXACO MARFAK

HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY



Your Fleet's Life-Line

Every truck you operate has a life-line which controls its span of useful service. That life-line is its electrical system. Through it—from generator to battery to spark plug—flows the electrical energy which makes Auto-Lite mean Auto-Life. Failure of any one of its complex parts can cause "out of service" delays—waste gas, oil and other critical materials.

So make the "life-line check" part of your regular inspection service. And remember, when badly worn units need replacement, put in original factory parts—they are your best guarantee of "like-new" performance. They can be obtained from your usual supply source or one of the thousands of registered Auto-Lite Service Stations near you.

These Are The Vital Units In Your Fleet's Life-Line

SPARK PLUGS BATTERIES
STARTING-LIGHTING
and IGNITION SYSTEMS

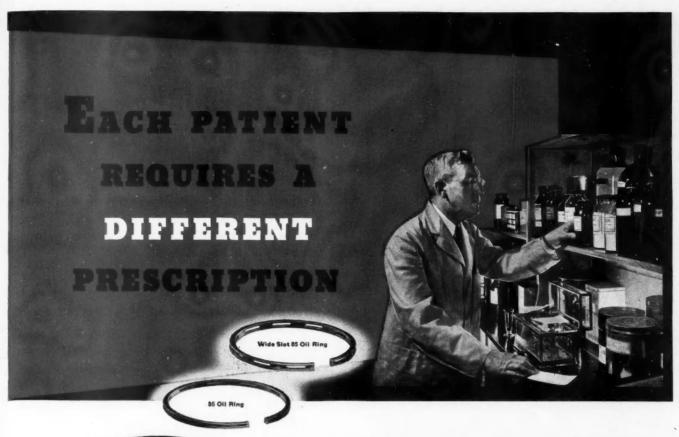
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Leading Car, Truck and Tractor Manufacturers specify Auto-Lite Electrical Equipment.

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AUTO-LITE AUTO LIFE

IN ITS 26 GREAT MANUFACTURING DIVISIONS, AUTO-LITE IS PRODUCING A LONG LIST OF ITEMS FOR AMERICA'S ARMED FORCES ON LAND, SEA AND IN THE AIR

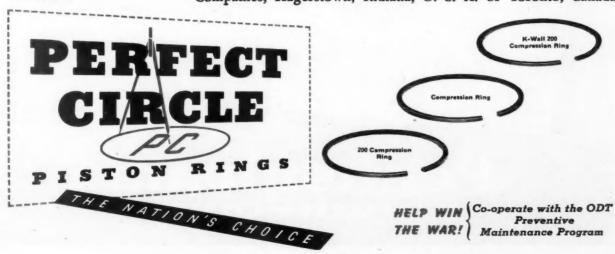


N the pharmacist's shelves are many drugs. A combination of some cures a particular ailment. A combination of others cures still another. But no *single* combination proves beneficial to *every* patient.

Now, to Perfect Circle engineers, it's much the same with piston rings. A combination that stops oil pumping and restores power in one truck may fail in another. For no single combination of any make will cut gas and oil consumption and improve performance in all units of your fleet!

On the other hand, the new Perfect Circle Diagnosis Plan makes it possible for fleet Maintenance Superintendents to be sure of greater operating economy and longer service from rings, pistons, and cylinders. More than 100,000 different Perfect Circle Piston Ring combinations are available under this plan—and it is possible to select the right combination for each specific make and model . . . for the particular condition of every engine . . . for the type of service to which each engine is subjected.

Find out how this plan can help you. Write: The Perfect Circle Companies, Hagerstown, Indiana, U. S. A. or Toronto, Canada.



ennsulvania Tires



THE RECORDS BACK UP THE CLAIMS

You get longest total mileage out of tire ration certificates with Pennsylvania Truck Tires. Scores of letters like the one printed below give the actual results.

Exclusive features of built-in strength make Pennsylvanias run cooler-stay sound and strong for more recapping or retreading.

Call on your Pennsylvania dealer-he can help you get the most mileage out of every ration certificate. He knows details of tire rationing; how to prepare the papers; how to select the right Pennsylvania Tires for your type of service.

Ask to have your retreads made with genuine Pennsylvania Retread Materials.

O. B. HUNT Produce Transport, GOULDS, FLORIDA

Oct. 15th, 1942

Mr. C. V. Hicks, Waldron Tire Co., Miami, Florida

The Pennsylvania Tires put on my truck over a year ago have never been off the rims. a year ago have never been off the rims.
Actual mileage recorded on these tires is
in excess of 100,000 miles, and from the
in excess of the treads they should go at least
looks of the treads they should go at least
twenty-five to thirty-five thousand miles
twenty-five to the to recap. I know it is
more before time to recap. I know it is
more before time to recap. I know it is
such mileage but I have the records to
back this claim.

I can assure you that after getting such back this claim. service from Pennsylvania Tires, I intend to use nothing but them in the future.

Yours very truly, 0. B. HUNT

O, B. Hunt



These are the tires Mr. Hunt tells about in his letter at left

Pennsylvania Storage Batteries are available for every automotive need.



RUBBER COMPANY

JEANNETTE, PA.



CHAMPION SPARK PLUGS

Shortage of vital materials and curtailment of gasoline make it imperative for all fleet operators to keep their equipment in first class shape at all times. To insure peak performance and maximum economy for every unit in your fleet, follow the ex-

ample of the A. B. & W. Transit Co. and standardize on Champion Spark Plugs. You can rest assured Champions will deliver dependable performance unequalled by any other spark plug. "Keep 'Em Rolling Longer" with Champion Spark Plugs.

NO JOB TOO BIG-NO WORK TOO TOUGH- for CHAMPIONS





1. Combat team tactics, coordinating the efforts of tanks, infantry and planes, is an important part of the strategy of American Armed Forces. It was also used successfully by General Montgomery in driving Rommel out of Egypt. Teamwork on the largest scale ever conceived by man will win Victory for America and our Allies in the fight for Freedom.

2. A. C. Scott, Vice-President, Geo. F. Alger Co., Detroit, specializes in doing the "impossible." Alger hauled the bulk cement for the Ford Willow Run plant, new Wayne Airport, and other projects. Scott inaugurated 24-hour maintenance—intensive inspection and driver care calling for 100% teamwork between all departments in his "turn on the steam for Victory program."

TEAMWORK WINS. In the armed forces . . . and on the home front, too . . . it takes teamwork to win! Timken's new A.M. (Axle Maintenance) Program tells you how to team up with your operating and maintenance departments to save tires, brakes, axles to insure longer vehicle life, cut costs and save critical materials. Write us today for FREE A.M. aids or talk to a Timken Field Representative—there's nothing to buy.



TIMKEN AXLES

THE TIMEEN-DETROIT AXLE COMPANY, DETROIT, MICHIGAN WISCONSIN AXLE DIVISION, OSHKOSH, WISCONSIN



Heat-proofed Stanolube H. D.

How this remarkable new oil will help you conserve equipment

Beats Heat . . . Stanolube H. D. was developed to combat the destructive effect of higher engine heats on motor oil. The efficiency of the internal combustion engine has been greatly improved in recent years. This has been brought about, in part, by increasing the horsepower through higher compression ratios, closer fitting parts, and higher engine speeds. But these changes have also increased operating temperatures of modern engines to the point where a conventional motor oil oxidizes 6 to 16 times faster than it did in engines of five to ten years ago.

That was the problem Standard Oil technicians started out to solve. And the new "heat-proofed" STANOLUBE H.D. is their answer.

Cleans Engines... There are motor oils that partly solve the oil oxidation problem by loosening sludge deposits, and by keeping

oxidized parts of the oil in suspension until they are removed by draining (a detergent action). But the rise in operating temperatures of heavy duty gasoline engines and the high temperatures in Diesels required more protection—an oil that would resist oxidation—a beat-proofed oil.

This is accomplished by combining, in Stanolube H. D., a special petroleum-base inhibitor, developed in Standard Oil laboratories, with a highly refined stock. The resulting oil has both a detergent action and unusual resistance to oxidation, even at temperatures above those encountered in present day engines.

This means that Stanolube H. D. practically eliminates troublesome varnish formation and other engine deposits, along with the resulting clogged oil lines and screens, and dirty filters—conditions that cause stuck valves and rings, bearing failures and excessive engine wear.

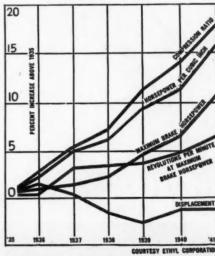
For Fleet Operators Only . . . War-time restrictions limit the civilian use of STANO-LUBE H. D., but because of the vital need for conserving your equipment it has been made available to fleet operators. Take advantage of this opportunity. Put Stanolube H. D. and Standard's Fleet Conservation Service to work on the biggest problem you have today—to make your present equipment last for the duration.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago, Ill., for the Engineer nearest you. In Nebraska, write Standard Oil Company of Nebraska at Omaha.



... doubles bearing life

Fleet Conservation Service more than doubled precision insert bearing life on Bringwald's Transfer Company fleet, Vincennes, Indiana. W. J. Bringwald (right), owner of the fleet, and Standard Automotive Engineer J. A. Mowbray examine a Bearing which had been damaged by sludge and varnish formation in the engine before the Engineer worked with the fleet maintenance men and eliminated the trouble.

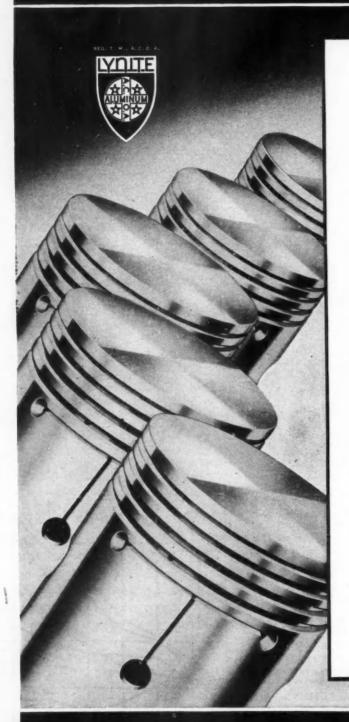


Trend of American bus and truck engines from 1935 to 1941, showing some factors contributing to higher engine heats.

Oil is ammunition . . . Use it wisely

STANDARD OIL COMPANY (INDIANA)

THEY'RE IN THIS FIGHT



Many of the automobile servicemen who were OHIO's good customers "on their own," before the war, are now meeting up with LYNITE* LO-EX PIS-TONS in Uncle Sam's fighting forces. That's where every piston we can make is going today.

We're glad these old friends are able to maintain this contact. They won't have a chance to forget that LYNITE PISTONS are the finest performers in any engine. And they'll carry the habit of saying, "Make mine LYNITE LO-EX," back into civilian life.

To make certain that there'll be a supply of these pistons ready for their service work, we're going to start them flowing to distributors just as soon as the war permits. LYNITE LO-EX PISTONS, machined and sold by OHIO, will again take their place as leaders in the replacement market.

*Lynite is a registered trade-mark of Aluminum Company of America, makers of castings for genuine Lynite Pistons.

THE OHIO PISTON CO.

CLEVELAND, OHIO



offers to supply your organization with "Plug-Chek" Indicators and Data Books. There is no obligation, just write on your letterhead to

THE ELECTRIC AUTO-LITE COMPANY

TOLEDO, OHIO

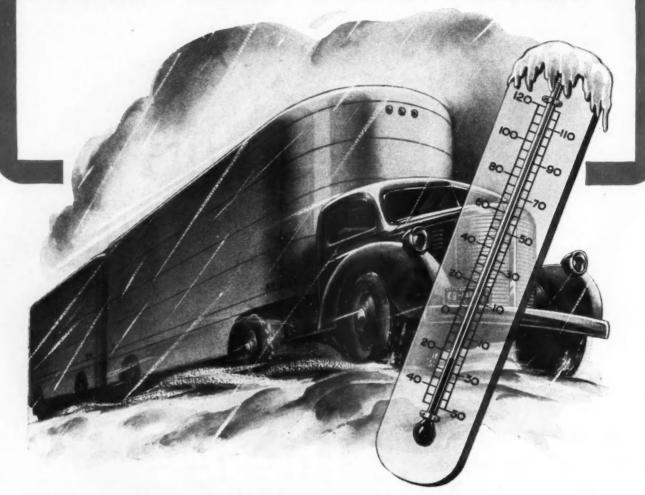
Merchandising Division

IGNITION ENGINEERED BY IGNITION ENGINEERS

SARNIA, ONTARIO

IN ITS 26 GREAT MANUFACTURING DIVISIONS, AUTO-LITE IS PRODUCING A LONG LIST OF ITEMS FOR AMERICA'S ARMED FORCES ON LAND, SEA AND IN THE AIR

GUARD VITAL CHASSIS BEARINGS AGAINST "COLD WEATHER FRICTION"

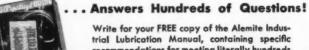


Alemite "Sub-Zero" Stays on the Job at Temperatures Down to 40° Below!

In extreme cold, ordinary grease stops lubricating—actually creates friction! But America's truck transportation system must function in all weather. Bearings must be guarded now as never before, because replacements are hard to get and delays hamper war

Safeguard chassis bearings in your truck fleet by using Alemite Sub-Zero Lubricant, which lubricates efficiently at temperatures down to 40° below zero! Meets government specifications types "D" and "F" applying to Class 14 of General Schedule of Supplies, U. S. Treasury Department; also Army specifications.

Alemite Sub-Zero is only one of many Alemite Specialized Lubricants designed to meet extraordinary conditions—to withstand cold or heat, water or steam. All are proved by years of successful service to industry.



trial Lubrication Manual, containing specific recommendations for meeting literally hundreds of lubrication problems in the transportation fields. Invaluable for superintendents and maintenance men. Ask for it, on your letterhead, today!



ALEMITE

LUBRICANTS · LUBRICATING EQUIPMENT · MOTOR OIL



Ask Anyone

1876 DIVERSEY PARKWAY, CHICAGO, ILLINOIS . BELLEVILLE, ONTARIO

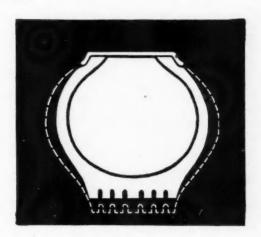


Correct Rim Size is Vital to Tire Mileage

ALL too frequently, an operator whose truck has been equipped with oversize tires will have more tire trouble and get less mileage than with the original equipment size. This is caused by retaining the original rims rather than changing to a size to fit the tire. Here's why the smaller size rim will not give satisfactory service.

- 1. The beads of the tire are squeezed close together, which pulls the tire out of its proper shape and throws a strain on the sidewalls.
- 2. Squeezing the beads closer together reduces the air chamber, thus lowering the carrying capacity of the tire. (The volume of air in a tire determines its carrying capacity.)

Always determine the correct rim size before buying oversize tires—then change to that size as quickly as possible.



For a wise buy on tires... Get "Heavy Service" Hood Tires

Backed by a lifetime guarantee and built with new "Speed-Run Construction" to haul heavy loads at high speeds, at lowest cost per mile.





"Heavy Service" Truck Tires
THE HOOD RUBBER COMPANY

A Division of The B. F. Goodrich Company Akron, Ohio Los Angeles, Calif.



THE LATEST IS THE

Micrometer PUSH-PULL CONTROL*

- FOR ACCURATE ADJUSTMENT

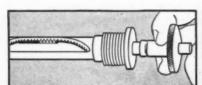
Here's a cross-section view of a PUSH-PULL CONTROL developed to meet the need for adjustment or control within almost infinitesimal limits—just one example of many special controls developed for American fighting automotive equipment.

In your planning for peace-time production remember this flexibility.

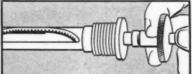
Wherever you want remote manual control, PUSH-PULLS can handle the job—give exact, trouble-free, rattle-proof control for the life of the vehicle.

Glad to figure with you—for war production today or for civilian use after victory.

*One size and type only—a rugged, he-man control. Also made in the same size with station positions but no other adjustment.

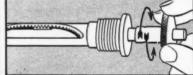


THREADS ENGAGED
Micrometer adjustment by turning knurled button



THREADS DISENGAGED

Press thumb to disengage threads for instant major adjustment



ROTATES FORWARD OR BACKWARD

Button rotates in either direction
for forward or backward adjustment

AUTOMOTIVE AND AIRCRAFT DIVISION 6-235 General Motors Building, Detroit - 695 Bryant Street, San Francisco

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT . CONNECTICUT

ESSENTIAL PRODUCTS... AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iran Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses... In Business for Your Safety







The Army's rolling to Alaska... on the road that "couldn't be built"

Man had never set foot on much of the wild frontier territory through which Army Engineers and contractors have punched their way to build the Alaska Highway... the most important military project since the Panama Canal.

Mountains stood in the way . . . their very grades hidden beneath the camouflage of forests never before penetrated. So did hundreds of bleak miles of muskeg, black mud and sub-artic ooze deep enough to swallow huge motor trucks and leave no trace of where they had stood.

Indomitable men and machines . . . many of them White trucks . . . slashed their way through, and in record time. Vital projects of this kind dramatize the

wartime importance of motor trucks.

But your truck, too, is important because it cannot be replaced. To conserve its life is your patriotic duty.

Investigate now the White Cooperative Plan of Truck Conservation
—a definite method prolonging truck life and saving critical materials. It provides all the facilities to enable you to fulfill the conservation pledge which the Office of Defense Transportation has asked every truck owner to sign.

THE WHITE MOTOR CO. • Cleveland

Builders of U. S. Army Tank Destroyers, Scout Cars, Half Tracs, Prime Movers and Cargo Trucks, the complete line of Super Power Trucks and Tractors, City and Inter-City Coaches, Safety School Buses and the Famous White Horse.

White

FOR MORE THAN 40 YEARS THE GREATEST NAME IN TRUCKS



Because of the mechanical and structural differences in the many types and makes of commercial automotive vehicles, there is a need for more than one type of air brake system. That's why Wagner engineers have developed THREE systems — each one designed for a specific type of service.

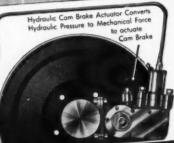
No matter what your air brake requirements are, one of the three systems graphically illustrated below will give you outstanding performance and economies.

Mydrau





1. WAGNER "HYDRAIR" SYSTEM for Cam Brakes Provides air-powered hydraulic actuation for commercial vehicles equipped with cam-operated brakes:





CONTROL EQUIPMENT All three of the Wagner airbrake systems employ the Wagner Rotary Air Compressor known for its economy and high efficiency, an air reservoir, and a metering application valve which can be either lever, push or treadle type.



2. WAGNER AIR-HYDRAULIC SYSTEM for Internal Hydraulic Brakes — The ideal system for converting manually operated internal hydraulic brakes into REAL air-powered hydraulic brakes.

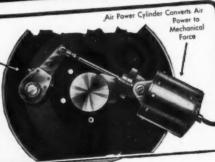


CAir Enters Here from Application Valve

Slack Adjuster Applies Mechanical Force to Cam Brake

System Requires one Wagner Pawer Cylinder and one Slack Adjuster for each Wheel Brake

3. WAGNER STRAIGHT-AIR SYSTEM for Cam Brakes — This system provides air-powered actuation for commercial vehicles equipped with camoperated brakes.



K43-1

Wagner Electric Corporation

6400 Plymouth Avenue, Saint Louis, Mo., U.S.A. BRAKES . TRANSFORMERS . MOTORS .

Bulletin KU-50 explains and illussusem RU-30 explains and illustrates the three Wagner air brake systems. Everyone responsible for the operation, maintenance and manufacture of commercial vehicles should have a copy. A post card will bring it.







Facts and Flashes

From the
Technical Service Department
ETHYL CORPORATION

FOR THE WARTIME BUS, TRUCK AND FLEET OPERATOR

1600 West Eight Mile Road
DETROIT, Michigan

"Skip-stop" schedules are doing much to improve mileage for many city bus lines. Decreased traffic and lower speeds have increased the mileage of some busses and trucks on the open road. Operators should take these factors into consideration when they find their vehicles giving more miles per gallon — so as not to ease up on proper maintenance in the belief that the vehicles are running "better than ever" and need less care.

More and more women are being employed as mechanics' helpers with view of making them full-fledged mechanics — and report women are doing an excellent job.

Many truck companies which would like to hire women for similar work and training are finding that the one drawback — and it isn't funny — is lack of adequate rest room facilities. Before you put 'em on the payroll — put in a "powder" room!

Office of Petroleum Administration for War is allowing refiners sufficient allocations of antiknock fluid to make civilian "regular" gasolines of at least 72 octane number. This means that no drastic measures, such as use of extra cylinder head gaskets (which reduce power and economy), are needed to lower antiknock requirements of the average commercial car or truck.

Appearance of new wartime tires on market is a tribute to the ingenuity of rubber companies — but does not mean that the nation's tire problems are solved. Operators should beware of optimism. There is still no rubber to burn.

Source of constant amazement to truck operators — and of pride to truck manufacturers — is the way the nation's trucks are standing up in spite of the terrific punishment they're taking in wartime. They're on the road more, in the shop less than ever — yet they keep right on rolling up the miles and delivering the goods for Uncle Sam.

Big problem of preventive maintenance doesn't so much concern the fleets as it does the millions of owners of one, two or three trucks who have never given their units systematic or proper care. U. S. Truck Conservation Corps is trying to get them to see the light — and oil companies may soon launch a special drive to sell the advantages of proper maintenance to non-fleet truck owners.

Special to truck operators: Read your daily paper for news of the thousands of American trucks that are more than proving their sturdiness in the African campaign. These military vehicles in many ways offer a preview of improvements you will probably get in your own equipment after the war.

Something to think about: The cannon shell from a Flying Fortress that blasts down a Jap Zero may travel the <u>last 500 yards</u> on gunpowder — but it travels the <u>first 500 miles</u> on gasoline! <u>Oil is ammunition</u> — use it wisely!

YOUR GENERAL TIRE DEALER IS A TRUCK TIRE SPECIALIST

He makes a business of

INSPECTING

MAINTAINING

REPAIRING

REPAIRING

TRUCK TIRES

KRAFT SYSTEM

KRAFTRED

Look for this ambiem on tires recapped by the Kraft System

Let experts who know how take care of your tires

CO

MORE THAN EVER

IN WARTIME BUY THE TRUCK TIRE THAT YOU KNOW GIVES YOU MORE QUALITY

- Built to the maximum specifications possible under Government Regulations
- With the same extra strong heat resisting cord always used in the General Tire
- By workmen who have never built anything but the highest quality



COMING? SYNTHETICS, RAYON, NYLON?

The General Tire of the future is well worth dreaming about! Imagine for yourself what new materials and processes may mean-more mileage than you've thought possible, no blowout worries, less air pressure, lighter weight yet more strength . . . the heat problem licked! True? You'll have to wait to see! But remember this: General's technicians are today discovering new ways to make rubber fight better . . . mak ing tires that fight and fly, tires that haul supplies on the production front . . . gas masks, barrage balloons, pontoons, assault boats and scores of other weapons. And you can be sure the lessons of war will bring you General Tires even farther ahead of ordinary truck tires than the famed Generals of the past!



2 GARAGE POSTERS. 21" x 28" postertells the same story for display on driver bulletin boards and service garage walls.

"HOW TO WHIP THE 4 SABOTEURS OF TRUCKING"

A Driver Education Program that brings Results!

1 FOLDERS...tell drivers how to save rubber by licking improper load distribution; under-inflation; high speed; mis-mating of duals.

C DASH STICKERS. 4"x3½" sticker has space to fill in load and inflation data, etc., reminds driver of need for tire conservation.

Available FREE from General Tire Dealers in Any Quantity Required

"How To Do It"...an educational, easily understood, sound slide film on truck tire maintenance . . . available for showing to employee groups. Ask your General Tire dealer for details.

Trucks...like Paratroopers...

must be "IN CONDITION"

• Stepping off into space at a dizzy height and taking the bumps in landing require steel-like nerves and muscles of iron. That's why our paratroops are trained in special conditioning schools. And War means your trucks must be IN CONDITION for harder, longer service, too.

Fleet servicing has to be better than ever—must steadily improve as your trucks grow older, too. So, put the brakes on truck wear by using your DeVilbiss Spray-Painting Equipment regularly—to guard body and chassis parts from rust—to keep your trucks from showing their age. Make better use of your DeVilbiss Service Equipment to save time for more thorough servicing.

And take care of this equipment that takes care of your trucks—it's hard to replace, too. Be sure to get the many worthwhile tips on care that your DeVilbiss distributor can give you. He's a good man to know these days.

THE DEVILBISS COMPANY • TOLEDO, OHIO

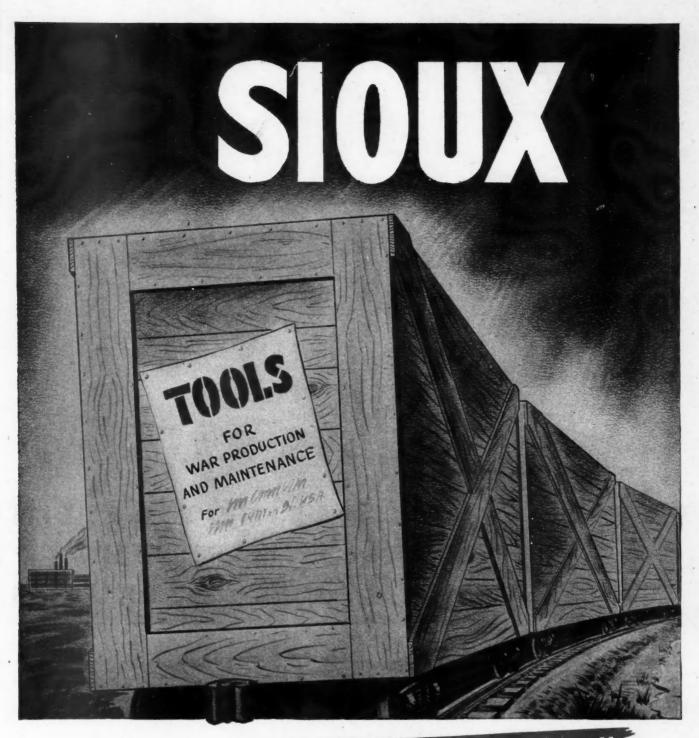






PROUD to have won the coveted Army-Navy "E" for excellence in war production, the men and women of DeVilbiss pledge to continue giving their all-out best—for Victory.

SPRAY EQUIPMENT . EXHAUST SYSTEMS . AIR COMPRESSORS . HOSE AND CONNECTIONS



We also are sticking to our "last"

The age old and wise adage "Shoemaker stick to your last" symbolizes the 100% war effort we are making in the manufacture of SIOUX TOOLS for the speedy production and maintenance of war equipment, such as Aeroplanes, Tanks, Trucks, Jeeps, etc.

We are doing the job for which we are un-

usually fitted by knowledge and experience, plus the best of equipment to do it speedily and better. The high standard of SIOUX TOOLS is being maintained in our war work and will be reflected in our peace time effort.

reflected in our peace time effort.

SIOUX TOOLS are built to give lasting service. Yours will last longer if given a little care.

STANDARD THE



WORLD OVER

SIOUX CITY, IOWA, U. S. A.



• Getting Marmon-Herrington All-Wheel-Drive Trucks for any kind of civilian service is almost impossible now—and it is easy to understand.

We appreciate, as well as you, that many civilian jobs are as essential to the successful prosecution of the war, as those of the military—but, in time of war, the

military comes first.

And shortage of trucks is only half of the story. By far the greater proportion of our factory space and facilities is taken up in the production of tanks and other military vehicles—some of which we are not at liberty to mention.

That is why we are asking all our friends — dealers and users alike—to have patience, to take the best possible care of the Marmon-Herrington equipment you have, and to buy U. S. War Bonds to the limit of your capacity. By so doing you can help your country, yourselves and us—in our combined efforts to win the war and return to our normal pursuits with the least possible delay.

MARMON-HERRINGTON

All-Wheel-Drive

MARMON-HERRINGTON CO., Inc., Indianapolis, Indiana

Autocar Haff-Tracks TEAM FIRE-POWER WITH HORSE-POWER



Wicked in its war-paint and bristling with cannon, your Autocar today is a big, burly, lunging brute . . . a mobile fort to carry the battle to the enemy, to shorten the road to peace. Yet, for all its fierce power, it is amazingly nimble, responsible to the controls. It is still an Autocar!

Tomorrow's Autocars will be even better for having had this combat experience. Creative fires burn at white heat in the crucible of war, out of which pour improvements vital to Victory today, advantageous to industry tomorrow. Keep your pledge to the U. S. Truck Conservation Corps. Your trucks are your own, but their life belongs to the Nation.



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Photograph Courtesy Autocar Co.

THE ENGINEERS ARE ON THE MOVE!



Our entire facilities have been turned over to the manufacture of heavy duty frames and other products necessary for the promotion of our national war effort.



----- and how! In modern warfare the task of smoothing the way for the swift movement of all mechanized units is up to the Engineer Corps. Bridges must be built that are capable of carrying heavier vehicles than ever before. These pontoon bridges must be erected, disassembled and transported swiftly and efficiently, together with all the necessary paraphernalia for their erection and placement.

All this requires prime movers with built in stamina—tractors and trailers that can take the rough going and come back for more. That is why these units are built on Parish Heat-treated Alloy Steel Frames—the frames with the "Spring-back".

The trucks in your fleet can also have this extra toughness. Parish Frames can take their beating for two to five years longer than ordinary frames because they have a fatigue value more than 200% greater than non heat-treated frames. Specify Parish Heat-treated Alloy Steel Frames—the frames with the "Spring-back".



PARISH PRESSED STEEL COMPANY, Reading, Pa.

Subsidiary of SPICER MANUFACTURING CORPORATION

Western Representative: F. Somers Peterson, 57 California St., San Francisco, Cal.

PARISH

PRESSED STEEL HEAT-TREATED FRAMES FOR TRUCKS & TRAILERS



TYPICAL

1½ TON JALOPY

Before

REBUILDING

and a few

POSSIBLE

Conversions

TRUCKERS can rely with confidence upon TRUCKSTELL to "make big ones out of little ones".

This confidence is justified because an original idea conceived years ago has been proved in the production of thousands of heavy duty conversion units.

TRUCKSTELL lengthens and strengthens the chassis frame for bulkier or heavier loads—installs special transmissions or two-speed axles, with multiple gears, to utilize the power to better advantage—builds six wheel units with third axles that simply trail or drive on all four rear wheels, and provides rubber and brakes that assure satisfactory performance.

TRUCKSTELL distributors know trucking as well as trucks. They have knowledge and expe-

rience which enable them to study various problems and recommend TRUCKSTELL conversions that will handle each operation with satisfaction and economy.

> Write for the complete TRUCKSTELL story and the name of the distributor in your vicinity



TRUCKSTELL four wheel heavy duty tractor conversion.



TRUCKSTELL-Thornton six wheel dual axle drive conversion.



TRUCKSTELL beavy duty four wheel dump truck conversion.



TRUCKSTELL six wheel trailing axle conversion.

TRUCKSTELL

CLEVELAND

CONVERTERS of TRUCKS for EXPANDED USEFULNESS
DISTRIBUTORS of Tested and Approved TRUCK EQUIPMENT

THORNTON

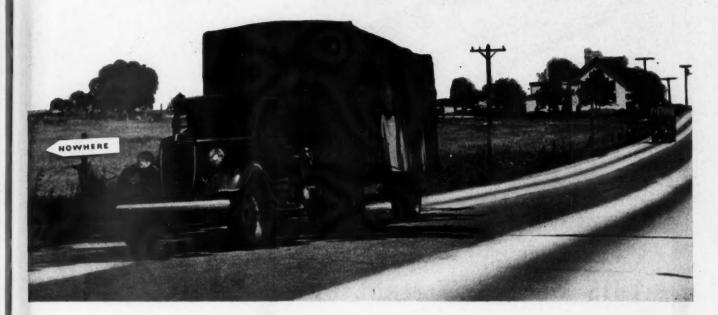
Four Rear-Wheel-Drive

CONVERSION

IN THE JUNGLES OF THE TROPICS; THE WASTES OF THE DESERTS; OR THE ARCTIC REGIONS — MONROES WORK EFFICIENTLY



THE ROAD TO NOWHERE-



Are your trucks traveling the road to Nowhere?

If they are not correctly lubricated at the proper service periods, that's exactly where your trucks may be headed — trouble and Nowhere!

With today's scarcity of replacement parts each breakdown may mean total loss of a truck's service.

ODT urges that "modern rules of lubrication should be studied and meticulously applied."

Sinclair Lubrication Charts and Preventive Maintenance Records provide you with a practical shortcut to "meticulous application" of modern lubrication. They tell where and when to lubricate, and specify the *correct* lubricants for wear saving at every frictional point.

These Sinclair Charts are yours for the asking. Use the coupon below. Send for them, today.



SINCLAIR	REFINING	COMPANY	
Truck Maintenance Dent			

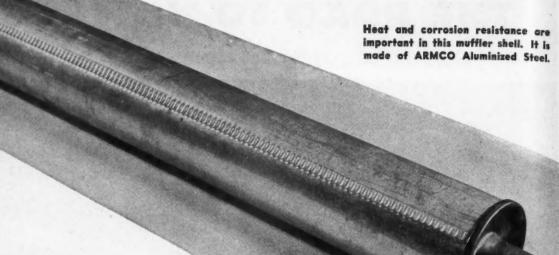
25th floor, 630 - 5th Ave., New York, N. Y.

Please send us, without charge, Sinclair Preventive Maintenance
Records for trucks, also information about
Sinclair Lubrication Charts.

Name

Street Address...

City and State..



THIS MUFFLER'S MADE OF

A NEW METAL ...

Resists Heat · Rust

TRUCK MANUFACTURERS will be interested in a new sheet metal now used in aircraft firewalls—ARMCO Aluminized Steel. This aluminum-coated steel provides exceptional resistance to heat and corrosion. Here for the first time are combined the surface advantages of aluminum with the strength of steel.

FLEET OWNERS AND SERVICE MEN likewise will be interested. When victory is won and vital metals again become plentiful, ARMCO Aluminized in mufflers and other parts will solve one of your toughest maintenance problems.

This is the story of Aluminized Steel: A tight, self-healing oxide film on the aluminum coating provides corrosion resistance and checks "pin-holing" of the coating. Armco Aluminized also resists heat

discoloration up to 1000°F., and will withstand severe oxidation at even higher temperatures.

The aluminum coating clings firmly in moderate drawing and forming operations.

If you are a manufacturer working on war jobs, possibly you can get Armco Aluminized Steel now. Other special Armco metals for trucks and truck parts include Paintgrip, Zincgrip, Stainless Steel and High Tensile. Write for complete information. Just address The American Rolling Mill Company, 491 Curtis Street, Middletown, O.



THE AMERICAN ROLLING MILL COMPANY



Announces

A NEW, NATION WIDE CONSERVATION SERVICE

公

公

To MAKE this new service available quickly, AC has placed trained men in the field to carry to all service organizations the latest and best methods of diagnosing trouble, testing, adjusting, and repairing AC products with a minimum of parts replacement. This will help to conserve material and shorten the time required for repairs.

Because all AC products are important to

the conservation of gas, oil, diesel fuel, and tires; and because some of them are so indispensable that their failure means that the vehicle is out of service; you will find this new AC service of great value to your shop.

So, AC urges you to take full advantage of its trained service personnel. You will find that your vehicles will stay on the road longer, perform better, and cost less to operate.

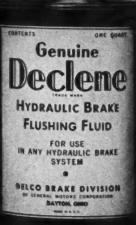
AC SPARK PLUGS • AC FUEL PUMPS • AC SPEEDOMETERS • AC OIL FILTERS • AC AIR CLEANERS
AC TEMPERATURE GAUGES • AC AMMETERS • AC OIL PRESSURE GAUGES • AC GASOLINE GAUGES

AC SPARK PLUG DIVISION - GENERAL MOTORS CORPORATION

Conserve HYDRAULIC BRAKE PARTS

Flush with DECLENE
FLUSHING FLUID

Refill with DELCO
SUPER 9 BRAKE FLUID



Brake fluid that has deteriorated, or that contains dirt, will shorten the life of rubber and metal parts in the hydraulic brake system. For effective fleet maintenance, flush the hydraulic system at least twice a year with Declene flushing fluid . . . refill with Delco Super 9 brake fluid.

Delco Super 9 is a safe, long-lasting brake fluid that gives positive action at all operating temperatures, from 50° below zero to 300° above. Use Delco Super 9 to maintain proper level in master cylinder, and for complete refilling after flushing with Declene.



Delco Super 9, Declene and Delco Brake replacement parts are distributed by United Motors Service and Bendix distributors.





Delco

BRAKE-MORAINE PRODUCTS
DIVISION OF GENERAL MOTORS CORPORATION

BUILDING FOR VICTORY

Delco Brake products are "in action" on combat cars and trucks of our fighting forces. Other armament materials and equipment are being built by Moraine Products Division to the limit of its facilities.

STANDARD FOR EQUIPMENT—THE STANDARD FOR REPLACEMENT

TRUCK OR TRAIN?



WAUKESHA POWERED Auto-Railer* rolls on roads or rails

A truck and a train in a single unit—the Auto-Railer* operates with equal efficiency on either road or rails; is quickly and easily shifted from one to the other. This flexibility is further increased by the versatility of power, speed and control of its Model SRKR Waukesha Engine. Auto-Railer* flexibility is a tremendous advantage in war work. In addition to critical materials, it saves man-power as well as man-hours.

The Model E-1 F-11 Auto-Railer* munitions train shown is used for the transportation of explosives in a large ordnance

plant. Its payload capacity is 40 tons—10 tons in the locomotive and 15 tons in each trailer.

In the Auto-Railer*, the Evans Products Co. of Detroit utilizes not only the greater flexibility of Waukesha Engines but their greater dependability which comes from super power and stamina, smoothness and acceleration, high fuel economy, longer life and lower upkeep. Get Bulletin 1079.

*Registered Trademark of Evans Products Co., Detroit, Mich., the manufacturers

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS., NEW YORK, TULSA, LOS ANGELES



WAUKESHA ENGINES



HYDRAULIC JACKS speed-up tire changes

- - on battle lines and on transport lines

Just as army trucks are prepared for action, your trucks should be prepared to avoid unnecessary loss of time in changing tires on the road.

Nobody can predict just when a truck may have to change a tire. But when the time does come, it pays to have a Hein-Werner Hydraulic Jack handy-ready for action.

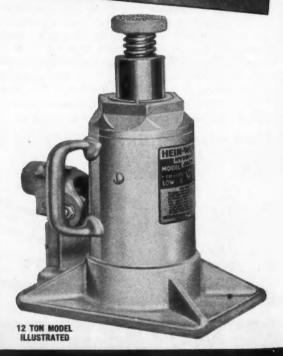
The speed and ease of operating a Hein-Werner Hydraulic Jack cuts down the "lost time" required to lift the tire clear of the road, change the tire, and get the job rolling again. Since time is so important, it will pay you to immediately equip your fleet with H-W Jacks.

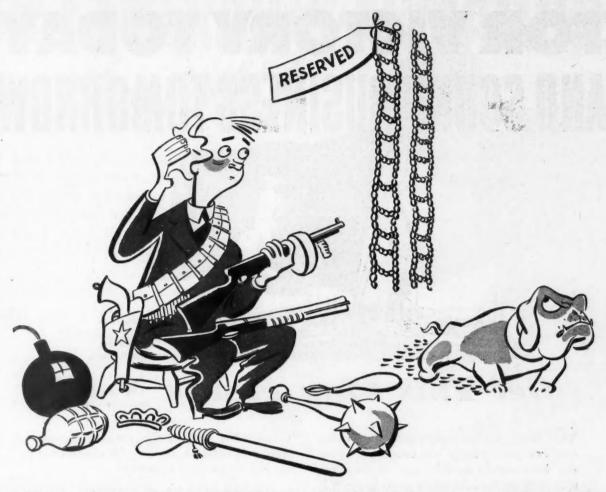
Complete line includes hydraulic jacks of 3, 5, 8, 12, 20 and 30 tons capacity . . . Quick delivery can be made on orders carrying priority rating.

For details and latest prices, ask your H-W jobber, or write us

HEIN-WERNER MOTOR PARTS CORP. Waukesha, Wisconsin

> **HEIN-WERNER** HYDRAULIC JACKS Are Built Right and Priced Right





"DRIVIN' THE TRUCK ALL DAY, GUARDIN' THE CHAINS ALL NIGHT, I WONDER IF I CAN LAST TWO MORE MONTHS WITHOUT SLEEP"

YOUR PYRENE JOBBER CAN HELP

in the tire-chain crisis of World War #2

War-needed freight must move, and your over-worked fleet must be guarded against the hold-ups and accidents of snowy, icy highways. Yet chain manufacture is rigidly restricted.

Your Pyrene jobber is doling out his available sets of Pyrene chains where they are most essential—but stocks are limited. He does, however, have the important replacement parts to service present chains. He urges you to replace NOW worn sections in every pair of chains that can be reconditioned. Get them ready for the next storm.

That is how he can help you prepare for safe, on-schedule movement during storm emergencies.



FOR VICTORY TODAY AND SOUND BUSINESS TOMORROW



Get This Flag Flying Now!

This War Savings Flag which flies today over companies, large and small, all across the land means business. It means, first, that 10% of the company's gross pay roll is being invested in War Bonds by the workers voluntarily.

It also means that the employees of all these companies are doing their part for Victory ... by helping to buy the guns, tanks, and planes that America and her allies must have to win.

It means that billions of dollars are being diverted from "bidding" for the constantly shrinking stock of goods available, thus putting a brake on inflation. And it means that billions of dollars will be held in readiness for post-war readjustment.

Think what 10% of the national income, saved in War Bonds now, month after month, can buy when the war ends!

For Victory today . . . and prosperity tomorrow, keep the War Bond Pay-roll Savings Plan rolling in your firm. Get that flag flying now! Your State War Savings Staff Administrator will gladly explain how you may do so.

If your firm has not already installed the Payroll Savings Plan, now is the time to do so. For full details, plus samples of result-getting literature and promotional helps, write or wire: War Savings Staff, Section F, Treasury Department, 709 Twelfth Street NW., Washington, D. C.



Save With

War Savings Bonds

COMMERCIAL CAR JOURNAL

Keep GENERATOR ARMATURES "on the job"!

You have a big job to do for America—the job of saving parts and materials. Don't replace armatures until you have made sure they can't be fixed. And when they can't be fixed, turn them in to your distributor.

HERE ARE 4 COMMON CAUSES OF ARMATURE FAILURE

- 1. Burned-up Armature. Look to see if the armature winding is burned to the point where windings are loose in the slots or cotton insulation is burned off. If this condition exists, turn the armature in and replace with another armature.
- 2. Grounded Armature. Test armature with test lamp for ground. Since a majority of grounds are caused by carbon dust from the generator brushes, this condition can usually be corrected by blowing dust out of windings and from behind commutators with an air hose.
- 3. Short Circuit. Put armature on a growler, holding a hacksaw blade or thin strip of steel over the armature core. If the blade vibrates at any point while armature is being turned one revolution, there is a short in the armature. The short may be between adjacent commutator bars or between leads.
- 4. Open Circuit. Rotate the armature in the growler and check for open circuit by progressively shorting adjacent commutator bars around the commutator with the hacksaw blade. If no sparking occurs between any two adjacent bars, an open circuit exists. The most common causes of open circuit are broken wires or connections which have become unsoldered at the commutator bars.



GET COMPLETE SERVICE INSTRUCTIONS

The instructions on this pageare just "highlights" taken from the United Motors Wartime Service Handbook. For complete instructions on servicing armatures and other Delco-Remy equipment, mail in the coupon below.



Delco-Remy

DIVISION, GENERAL MOTORS CORPORATION
ANDERSON, INDIANA



Delco-Remy service parts and service information are distributed by United Motors Service through independent automotive wholesalers.

WORLD'S LARGEST MANUFACTURER OF AUTOMOTIVE ELECTRICAL EQUIPMENT

Send for your FREE copy of the

OF THE UNITED MOTORS WARTIME SERVICE

HANDBOOK

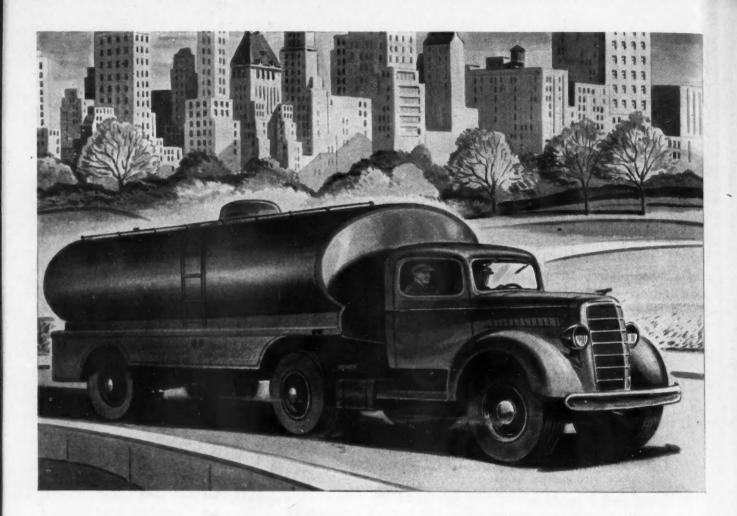
UNITED MOTORS SERVICE
GENERAL MOTORS BUILDING
DETROIT, MICHIGAN
Please send _____copies of

Please send__copies of the United Motors
Wartime Service Handbook to:

Name_____

City____State____

2-C1



What about the rubber tired cows in wartime?

TWENTY large cities receive all their milk by truck.

Four other large cities receive more than 96 per cent of their milk in this way.

What are fleet operators and owners doing to keep these rubber tired cows rolling from dairy to city? The answer to that question is part of the larger story of preventive maintenance, salvage of used parts, and new methods which the trucking industry has put into effect.

It is a story of ingenuity, common sense, and getting the utmost in dependability out of every truck accessory. It includes the use of Fiberglas-equipped batteries for the added dependability and longer life needed today to keep 'em rolling.

★ these batteries have unusual staying power; in some cases, double

power; in some cases, double that of comparable batteries without Fiberglas* Retainer Mats. (1)

(1) According to impartial tests conducted to meet S.A.E. Specifications. * these batteries stand up under extreme vibration; an important reason why they are used in many armored cars, tanks, and submarines.

* these batteries have excellent coldstarting characteristics and higher

average power output during lengthened life.

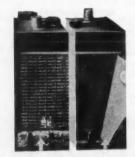
For the reasons why Fiberglas-equipped batteries have the superiorities, see diagrams and captions at right.

Because the Army, Navy, and war industries are demanding such great quantities of Fiberglas Retainer Mats, batteries equipped with these

mats may become harder to get. We are sorry, but we're also mighty glad that the armed forces are finding Fiberglas-equipped batteries highly important in the operation

> of many types of war machines. We are determined to provide enough Fiberglas for every vital wartime use where Fiberglas is the only material suitable for the job

to be done. You can help too—take "extra special" care of your Fiberglas-equipped batteries . . . keep them in service. Owens-Corning Fiberglas Corporation, Toledo, Ohio. In Canada, Fiberglas Canada, Ltd., Oshawa, Ont.



Left: Without Fiberglas Retainer Mats power-producing material sheds to the floor of battery gradually piling up sufficiently to short the cell.

Right: With Fiberglas Retainer Mats active material is held in place longer on battery grids, giving longer battery life and more constant power.

FIBERGLAS

*T. M. Reg. U. S. Pat. Off.

BATTERY RETAINER MATS

NOW--MORE than EVER



LINCOLN LUBRICATING EQUIPMENT

provides the type of lubrication service required to keep essential transportation rolling

Prior to the war Lincoln ads carried a line which stated "It is better to buy Lincoln equipment—than to wish you had."

Today those fleet owners who bought Lincoln equipment fully realize the value of owning a Lincoln set-up. These owners know that this equipment provides the type of lubrication service required to keep

essential automotive transportation rolling.

Trucks must be maintained for hauling war materials to and from factories, and so must vehicles transporting people to and from work.

Therefore, if your lubricating equipment (regardless of make) requires service, or if is is inadequate to do the job, consult your nearest Lincoln jobber or write us.



LINCOLN ENGINEERING COMPANY

Pioneer Builders of Engineered Lubricating Equipment

ST. LOUIS, MO., U. S. A.



.. and they PROTECT your trucks!

You know how it is with a lot of clutches. You baby them along. You race the engine, hoping to get gradual pick-up. And then—BANG, they're likely to take hold with a jerk that loosens your back teeth . . . that punishes the truck all the way from the engine to the rubber on the ground.

But Lipe Heavy-Duty Clutches never get that way. They give balanced pressure—the pressure of a single spring balanced equally all around the plate by 20 pressure levers. That means smooth, even engage-

ments. All parts of the plate touch evenly and at the same instant. There are no burned patches. No shock. No grab. No strain on engine, drive-line or axles. No scuffed rubber.

You get hundreds of more gear engagements between teardowns. And here's an important point-you can adjust a Lipe Clutch without tearing it down. Furthermore, you need no special tools or fixtures when you do tear it down. Write today—just drop a postcard and ask for your free copy of the latest Lipe Service Manual. It tells you the facts—why Lipe Clutches are easier on your trucks, and easier to service.

The even pressure of a single spring instead of the unequal pressures of a dozen or more unbalanced springs . . . plus 20 equally-spaced pressure levers to insure that all parts of the plate touch evenly and at the same instant. That's why the balanced Lipe clutch is a basically better clutch. Here's another fundamental of long life: Lipe employs the PUSH-TYPE release, in which the throw-out bearing operates ONLY when clutch is released.



HE PRINCIPLE OF THE LIPE CLUTCH

-ROLLWAY CORPORATION

Syracuse, N. Y.

Don't Overlook This Important Contribution To Fleet Maintenance



In the maintenance departments of large fleets and small, the Packard Certified Re-Wiring Manual, "Copper Nerves," is in constant use as a reference book on electrical service. Packed with illustrations, diagrams and tables—arranged and indexed for easy use—this compact handbook covers all important points in the starting, ignition, lighting and accessory circuits. It gives mechanics a complete picture of how the electrical system operates, how to locate trouble by a fast and accurate checking procedure, and how to make proper repairs and replacements.

The Packard Certified Re-Wiring Manual is FREE to all fleet users of Packard cable. It will help you make the most of the extra MPR—extra Miles Per Replacement—that Packard cable provides. Packard Electric Division, General Motors Corporation, Warren, Ohio.

THERE'S MORE

*

(*Miles Per Replacement)

IN PACKARD CABLE

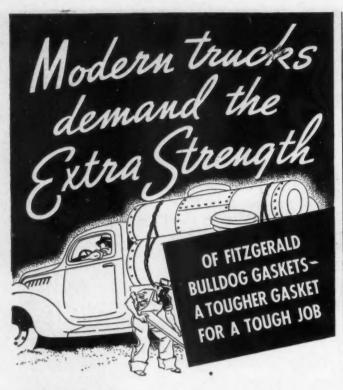
Tackard,

REG. U.S. PAT OFF.

TRADE MARK

"Working for Victory"

THE STANDARD WIRING EQUIPMENT OF THE AUTOMOTIVE INDUSTRY



Finest materials, scientific design and expert workmanship make the FITZGERALD Bulldog Gasket remarkably strong and durable, extra heat-resisting and extra shock-proof.



You can count on these better gaskets to measure up to the most rigorous demands of modern heavy duty service. Let your jobber give you details of FITZGERALD'S complete gasket service, which includes gaskets and grease retainers for every need. The FITZGERALD Manufacturing Company, Torrington, Conn.—Branches, Chicago and Los Angeles -Canadian FITZGERALD. Limited, Toronto.





... that's KESTER'S MIDDLE NAME!

- Kester Cored Solders have helped "keep 'em rolling" ever since the first gasoline-driven commercial vehicle made its timid, chugging debut. And Kester Cored Solders in America's greatest war, still get first call to help "keep 'em rolling" in all good automotive shops, where vital truck transportation is maintained at top efficiency.
- Kester Cored Solders make permanent repairs. Due to superior quality, they resist bending, vibration, shock, contraction and expansion. They match in stamina the trucks they help maintain. However tough the job, Kester Cored Solders won't let go!
- Kester Acid-Core Solder, old "stand-by" in maintenance shops, is the general-purpose solder for all-around repairs. Kester Rosis-Core Solder, specially compounded for all electrical work, prevents short circuits and resistance from corroded terminals. It contains a patented, plastic rosin flux that won't injure insulating materials or start corrosion. It eliminated an important fire hazard.
- Kester Cored Solders speed up shop work, help you cut maintenance costs. Standardize on them in your operation; order from your FORVICTORY

KESTER SOLDER COMPANY 4205 Wrightwood Ave., Chicago, Illinois

iobber.



Eastern Plant: Newark, N. J.
Canadian Plant: Bramtford, Ont.

KESTER

Cored Solders

FOR EVERY AUTOMOTIVE USE

LATE WINTER STORMS

are often the WORST!

It's Never
"Too Late in
the Season"
for

Walter Snow Fighters

SOME of the worst blizzards of recent years have come late in March. But communities equipped with Walter Snow Fighters have always in readiness the most efficient units known for bucking heavy snows and deep drifts, scraping hard-packed snow and ice, or handling other end-of-the-winter conditions. And when winter's over, the same Walter Truck becomes a "handy man" for spring chores like scraping unimproved roads after a rainstorm, excavating for road construction, emergencies, or other heavy hauling tasks incident to road mainte-

Tremendous power-plus-traction enable Walter Tractor Trucks to keep going under the toughest conditions. Three automatic lock differentials proportion power to each wheel according to its traction at any instant. No wheel shirks, every wheel works, on snow, ice, dirt, mud, grades and other difficult running conditions. Suspended Double Reduction Drive, Tractor-Type Transmission and other exclusive features contribute further to the unfailing service

of Walter Tractor Trucks in rough going. Write for full information regarding Walter 4-Point Positive Drive

WALTER MOTOR TRUCK CO.

1001-19 Irving Ave., Ridgewood, Queens, L. I., N. Y.

TOOL-POWER BUILDS HORSE-POWER!



Tools build fighting equipment. They assemble, disassemble and service and service. On the tanks, planes, ships, and jeeps. On the tanks, planes, tools are as necessary as battle front, tools are as necessary as bullets—on the home front, as bullets—on the home front, as

An important part of America's toolpower is supplied by Williams, a
power is supplied by Williams, a
leader for over sixty years. Today,
leader for which they were
to those for which they were
to those for which they were
originally purchased. Users everyoriginally purchased. Users everywhere have found that with wise,
where have found that with wise,
leader for which williams. Tools
careful handling, Williams, Tools
repay them many times over in
work quickly and well done.

J. H. WILLIAMS & CO., BUFFALO, N. Y.



DROP-FORGINGS & DROP-FORGED TOOLS







Studebaker craftsmen again give "more than they promise"

The devastating bombing power and matchless fighting power of the Boeing Flying Fortress make comforting daily items in the war news. Much of the flying power for this invincible dreadnaught of the skies comes from Studebaker, long regarded as one of the world's foremost builders of motor car engines.

Studebaker, America's oldest manufacturer of highway transportation, is privileged to collaborate with Wright, America's oldest producer of airplane engines, in this vital assignment. And Studebaker is also building much other war matériel including tens of thousands of big, multiple-drive military trucks for the forces of the United Nations.

Today, as for generations past, Studebaker craftsmen make their watchword—"give more than you promise." Every Studebaker em-

ployee is justly proud of the achievements of his organization in the arming of our Nation and its Allies.



War Trucks for the United National Studebaker, famed for years for dependable transportation, has now become one of the largest producers of big, multiple-drive military trucks for the forces of the United Nations.



AMERICAN BOSCH

AVIATION & AUTOMOTIVE **ELECTRICAL PRODUCTS**

FUEL INJECTION EQUIPMENT

American Bosch Corporation Springfield, Mass.



TRY THIS ON YOUR RESENT THEN TRY IT ON A

BOWMAN Plastic LENS

Bowman Lenses are flexible, color fast, weather proof, shatter proof and economical.

FREE Sample immediately upon request to Fleet Operators or Jobbers.

BOWMAN AUTOMOTIVE PLASTICS CO. 4316 W. 192nd Street, Cleveland, Ohio

GET MORE MILES

per pound of precious rubber with cooler-running, longer-wearing

SEIBERLING

Heat - Vented

TRUCK and BUS TIRES

SEIBERLING RUBBER CO., AKRON, OHIO

For a Smooth. Safe Ride at Lower Cost, use

Hydrau-Matic Shock Eliminators

The Cleveland Pneumatic Tool Co. Cleveland, Ohio





have made more than a 25 per cent reduction in over-all mileage. However, a 40 per cent reduction may be necessary, he said, due to the present shortage of rubber for truck oper-

He urged the industry to take the lead and do whatever is necessary to pool delivery services and standardize wholesale and retail deliveries. This, he said, will produce further and necessary conservation.

In conclusion, he warned operators that enforcement of ODT order No. 17 will be much more stringent in the near future, and that it may become necessary to take further steps, whenever and wherever necessary, for conservation.

END

(Please resume your reading on P. 54)



International Harves ter Co. has announced that W. C. Schu-m a c h e r, formerly manager, western
district, has been
placed in charge in
Motor truck sales.
Before his transfer to the west, he was a special truck sales representative in Chicago from 1935 to 1941; previous to that, branch manager

in New Orleans. The company also announced the promotion of P. V. Moulder, assistant do-mestic sales manager of trucks, as assistant to second vice president J. L. McCaffey





 When you can't get Imperial brass fittings you can use these Imperial plastic fittings with copper, steel or plastic tubing. Available in a large variety of sizes in the popular types.

Plastic tubing as a substitute for copper and steel is also available. Bulletin No. 331 gives complete in-

formation and prices. Order from your JOBBER

THE IMPERIAL BRASS MFG. CO. 1209 W. Harrison St., Chicago, Illinois

DAYTON Spoke Type Steel

FOR TRUCKS, TRAILERS AND BUSES. THE DAYFON STEEL FOUNDRY CO. DAYTON, OHIO

THE Decalcomania that is . .

FIRST in

APPEARANCE **ECONOMY** DURABILITY

Permalux "KOLORFILM"

PERMALUX "KOLORFILM" decals offer greater durability and economy in application and maintenance. Completely synchronous with modern truck finish, they last longer . . look better!

IT'S MADE OF DEPONT "DULUX"

Write TODAY for details.

THE PERMALUX COMPANY

900-10 West Lake St.,

Chicago, III.

Both "V" TYPE and ONE WAY BLADE TYPE

hand or power hydraulic control FOR ALL MOTOR TRUCKS FROM 1½ to 10 TONS

Write for cotalog 38AC and 38BC with discount to truck.

CARL H. FRINK, Mfr., CLAYTON, 1000 Isl.,

DAVENPORT-BESLER CORP., DAVENPORT,

FRINK SNO-PLOWS OF CAN. Ltd., TORONTO,

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